

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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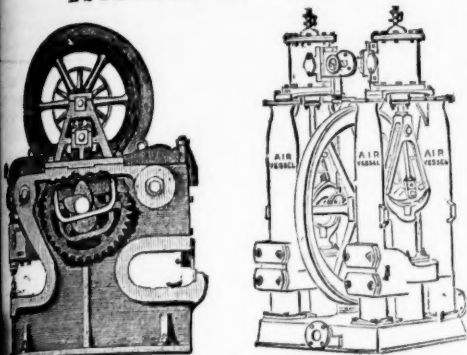
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LONDON, SATURDAY, OCTOBER 27, 1877.

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PARIS,
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ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

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At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-
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sure was reduced to one-half atmosphere (7½ lbs.), showing
almost the entire motive force to be available for the blow
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Machines for the SEVERN TUNNEL; the LONDON AND
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NEL; and the BRITISH GOVERNMENT for several Public
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six times the speed of hand labour, according to the size and
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Drill—may be worked at a higher pressure than any other
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Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton,
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course, if it had been wholly engaged in dressing wastes our returns would have
been greater; but it is giving us every satisfaction, and bringing the waste heaps
into profitable use, which would otherwise remain dormant."

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pleasure in stating that a full and superior set of your Ore Dressing Machinery has
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better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,
says—"Your machinery saves fully one-half on old wages, and vastly more on the
wages we have now to pay. Over and above the saving in cost is the saving in ore,
which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The
separation which they make is complete."

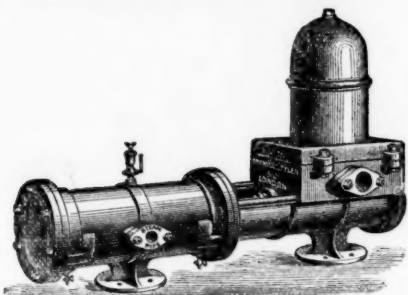
Mr. MONTAGUE BEALE says—"It will separate ore, however close
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Mr. C. DODSWORTH says—"It is the very best for the purpose
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1869—The Standard—

"The action is perfectly quiet."

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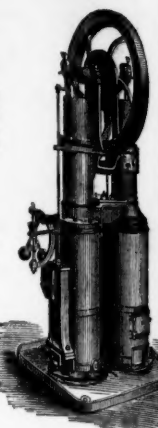
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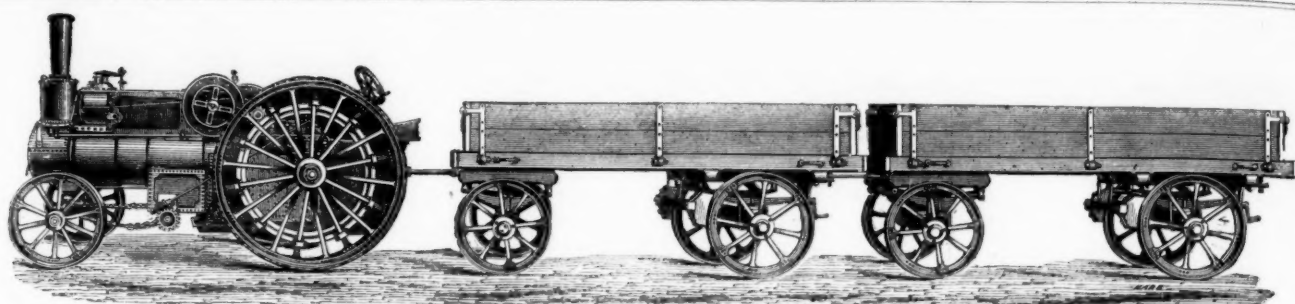
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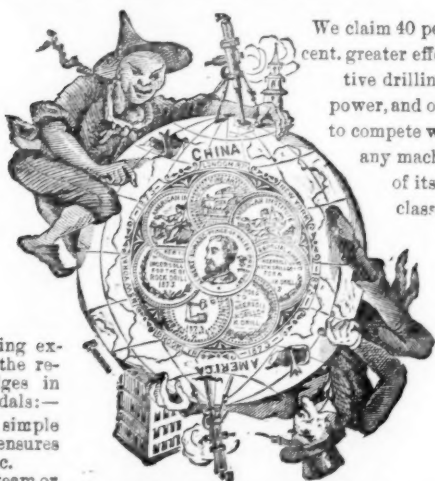
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Archer's New Patent Stone Breakers

Sole Makers: DUNSTON ENGINE WORKS CO.,

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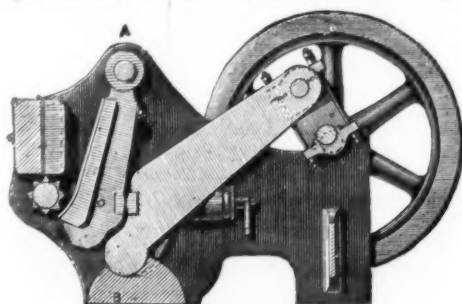
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Machines with combined Vertical Jaw and CUBING ROLLER.

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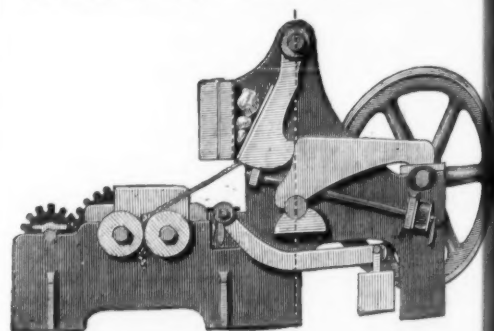
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NOTES FROM THE WEST OF ENGLAND.

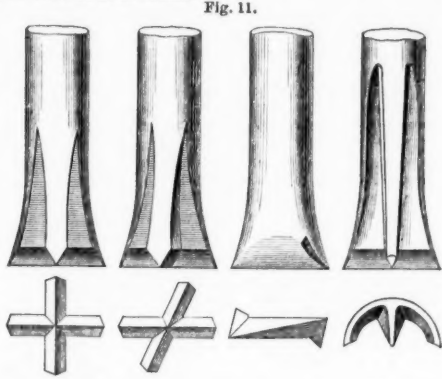
Rich as is the West of England in all that is calculated to interest the geologist in the pursuit of one of the most interesting and valuable of his sciences, or the mining and mechanical engineer desirous of increasing his knowledge as to the various modes of raising minerals or in the construction of engineering and other appliances, the information served up on these subjects from the western counties, it must be admitted, is very meagre indeed. Our knowledge, consequently, of what is being done for the advancement of science, or the state of trade, in a large and important section of the kingdom, is far below what is vouchsafed to us from other districts, especially those of the Northern and Midland Counties. Yet, if one travels from Worcestershire, and visits the mines and manufacturing localities between that county and Somerset and Devon, a vast field will be passed through of almost unexampled interest to those who desire to be made acquainted with a geological particularly rich in geological grandeur and boldness, as well as in wild and picturesque scenery, and where coal, iron, lead, copper, limestone, and the finest of building stone are most extensively worked. We purpose, however, confining our remarks most particularly to the state of those industries connected with the mining operations and the production of pig and manufacture. Taking Worcestershire as a starting-point, the first noticeable feature after leaving Bromsgrove, well known for its nail factories, are the brine springs at Stoke Prior and Droitwich, and which are considered to be the wonders of geology, for their origin has not been ascertained. The brine springs emanate from the triassic beds, and it is also from the beds of the trias and the overlying lias that our mineral and saline springs have their origin. The latter force their way to the surface through the strata of lias, and take in their way the solutions of chloride and sodium (salt brine), sulphate of iron, lime, soda, &c., and thus by the mixing of these properties we have what are termed mineral waters. Worcestershire produces nearly 300,000 tons of salt annually, and the quantity would appear to be almost inexhaustible. Worcester, which is only distant a few miles from Droitwich, was formerly noted for its locomotive engine-works, and close to the Midland station there is a large and handsome pile of buildings, where the work was carried on. However, the work did not pay, and engine-making has been abandoned. There are, however, two or three good factories in the city, where stove-grates and general castings are produced, finding work for a considerable number of men. Some of the pig used, it appears, is from the furnaces of the Staveley Company, near Chesterfield, and is passed direct over the Midland Railway, which also takes a considerable quantity of coal to the neighbouring towns from Derbyshire.

Gloucestershire has long been noted for its coal, hematite and iron; but at the present time trade generally is in a very depressed state. In Gloucester itself there are a few ironworks doing tolerably fair trade—one of them, the Atlas, making patent water pumps and pumps, and hydraulic machinery for riveting, punching, &c. In the Forest of Dean, with its peculiar privileges to miners, the greater part of which belongs to the Crown, great distress prevails amongst miners and ironworkers, particularly the latter. The coal field is only about 34 square miles, with 15 seams of coal, only eight of which are of a thickness of 2 ft. and upwards. There appears to be only a couple of Mr. Crawshaw's furnaces in blast, which certainly speaks volumes for the state of the trade. In 1870 there were 10 furnaces in the Forest, of which seven were in blast, producing upwards of 60,000 tons of pig-iron, whilst last year there were four furnaces in blast, and the output of pig 28,108 tons. Coal production has also declined, whilst in almost every other part of the kingdom it has increased. In 1872 the quantity of coal raised in the collieries in the Forest was 730,409 tons, whilst in 1876 it was only 668,009 tons. This falling off shows in what state a large number of the population of the Forest must now be in, seeing that the trade is considerably worse than it was during any part of last year, several works being entirely closed. It may then be assumed that the mining districts in which the men are the worst off in the kingdom are those where the minerals are owned entirely by the Crown. It is to be hoped, however, that the Crown Commissioners will take some steps to alleviate the existing distress which prevails to such an alarming extent at Parkhead and other places. Between Gloucester and Bristol there are several extensive collieries and other works. Leaving the train at Yate, we get into a locality at one time was in a more prosperous state than it now is. At a great distance from the station there is every evidence that lead was at one time worked there, and some good specimens of ore have been found. The probability is that lead mining could now be profitably cultivated in the locality alluded to, for there is little doubt that the mode of working before the place was abandoned was of a very primitive character, otherwise lumps of lead ore would scarcely have been left at the surface. Rather less than three miles from the station is Frampton Cotterell, where for several years a large quantity of fine brown hematite, containing more than 60 per cent. metallic iron, was raised. In going down and following the vast body of water was liberated, notwithstanding the putting of powerful pumping machinery, and the work has been stopped. It is to be hoped, however, that before long operations will be resumed, seeing that there is a large and valuable plant and access to the ground, with a line of railway to the Midland at Yate. What is termed the Bristol and Somersetshire coal field, at its northern limit extends to Coal Pit Heath (near Yate), Parkfield, and Cogwood. South of Bristol the boundary of the coal field sweeps round to the westward, and is lost under the sea beyond Nailsea near Clevedon, in Somersetshire. The measures extend to the Mendip Hills, where there are several seams of coal, which are faulted and broken up in a singular manner. One of the places the coal measures in a vertical position along the eastern base of the Mendip Hills, the axis of which is parallel to the former, and ranges east and west. The coal measures have not been advanced much west of Stratton-on-the-Fosse; but there is every reason to believe that they are covered over by the lias and red sandstone on the north-west flanks of the Mendips. Super and lower coal measures, it may be said, are divided by Pennant grits, whilst around the Bristol field the carboniferous mountain limestone is finely developed, forming the chief scenery of the Mendips, the headlands of Portishead, Clevedon, the Hill, and Bream Down, at Weston-super-Mare, and from the Steep and Flat Holmes. At Ashton Vale, by the side of the Avon, a short walk from Bristol, there are extensive works in addition to the large colliery. Trade, however, is far from good, that the collieries are only partially employed. The Bedminster colliery at South Liberty is now nearly developed, there being 4 ft. of good house coal, which before long will be worked on an extensive scale. The blast-furnace belonging to the Ashton Company is out, owing to the limited demand there has been for time for pig. At the adjoining works of Mr. Tinn, however, there has been active at the sheet rolling-mills, there being some orders in hand for India, Glasgow, &c. The Malago Vale colliery, which has been standing, will shortly be re-opened. At Mr. Bennett's Old Bedminster Colliery, a steady business has been done, the output being large. To the west of Bristol there is a lower shales. In that district two new collieries have been opened out, and at one of them a large tonnage of coal is being raised, and for the purpose of still further extending operations a branch line has been made from the colliery to the Bristol and Gloucester Railway, by which it is expected a good deal of coal will be sent some distance away. At the Easton Colliery, belonging to Mr. Leonard, business is rather flat, the colliery working on an average about four days a week. The deep sinking at Henham, undertaken by a few parties, is progressing, and it is expected will be taken to a considerable depth, which will solve the difficult problem as to the actual depth, quality, and thickness of the coal. At Cossham and Netherhead's Colliery, at Kingswood, trade is considerably better than at several other places, a good deal of coal being for the use of the Midland Railway. The Parkfield

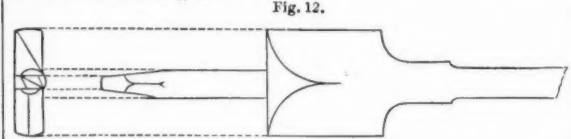
Collieries are also getting along tolerably well in supplying house and gas coal, the men being employed about five days a week. In the Radstock district business is rather quiet, the competition with the Derbyshire coal carried by the Midland being rather keen. The fine Silkestone coal of Derbyshire, bright and free from dross and in cubes, appears to be making its way in the estimation of the public in Bristol and other places, and with the facilities afforded by the Midland and a fair carriage rate, there is little doubt but it will be far more extensively used than it is at present. It is advertised to be sold in Bristol at 20s. per ton; and we also observed that the same coal is finding its way into Bath, Weston-super-Mare, and other places. A comparison between it and the dull and heavy coal delivered from most of the local collieries will preposess the most determined stickler for native produce in favour of it. Lead mining on the Mendips has almost fallen to nil, and there has, consequently, been a marked decrease in the number of persons employed. In conclusion, as the result of our visit to the West of England, we must say that the coal and iron trades are in anything but a healthy state, and that there is great room for improvement, although the indication of such are certainly not particularly promising.

ROCK-BORING MACHINERY—No. X.

TOOLS.—The method of fixing the tool to the end of the piston-rod has received a large amount of attention from inventors. In 1866 Jordan and Darlington introduced a loop-clip. Later a binding ring came into use. Improvements on these methods are in progress, the object being to retain the tool on the axial line of the piston-rod, without resorting to rings, clips, or set screws. The form of the boring-bit has also undergone radical changes, in some instances rendered necessary, not for the purpose of drilling a round hole, but for neutralising the imperfect action of the turning gear employed. The following figures, which will explain themselves, show "bits" of various forms, the use of which is advocated by inventors of various rock-drills.



Another form of tool for running down centre or "rupturing" holes is shown in Fig. 12.



The bit, Z-shape, is the same size as the ordinary drills; but it has also an enlarged part, armed with a Z-shape cutting edge, 4 in. diameter. The length of the boring tools will depend upon the depth of the intended hole. At Ronchamp the longest hole was 9 1/2 feet. At St. Gothard it is about 8 ft., while at Musconetcong Tunnel, New Jersey, the leading holes were usually 10 ft. deep, the longest 14 ft.

In ordinary mine headings, and in the employment of comparatively small boring machines, the diameter of the boring steel may vary from 1/2 in. to 1 1/2 in. For rupturing the rock with No. 1 dynamite, or Brain's No. 1 powder, the hole at bottom need not exceed 1 in. in diameter; but if second-class dynamite or compressed powder be employed the hole in that case should be larger. In changing a boring tool care must be taken that the cutting edge of the one to follow it is not wider than the intact cutting edge of the tool withdrawn. In the tool withdrawn it will be often found that the corners have been partly removed; the cutting edge of this tool is, therefore, that portion not rounded, but roughly parallel to the face of the hole. Many instances occurred in the rudimentary stage of boring, when machines were alleged to be useless—the fact having been that the cutting edge of the second tool was wider than that of the tool withdrawn, which forced into a conical part of the hole, necessarily wedged itself fast, thereby stopping or retarding the working of the machine. As a common rule, the width of the different sets of boring tools at the points should vary from one-sixteenth to one-eighth of an inch from each other; or if the leading sets of tools are 1 1/2 in. wide at the point, the second or "follower" set may be 1 1/4 in. and the third 1 in. wide. No rule can be strictly laid down for determining the time and power requisite to bore holes of varying diameter; but experience seems to show that if a hole 12 in. deep and 1 in. diameter takes four minutes, a hole 2 in. diameter and of like depth, bored with the same machine, and under the same conditions as to pressure of air and speed, will take 16 minutes. In other words, the machine and fluid pressure being the same, the time and power required to bore holes to a given depth are as the square of the diameter of the hole. It is, therefore, of considerable importance to keep the diameter of the shot-hole as small as possible, and to supplement mechanical power by employing strong rupturing explosives.

Tunnel or Mine.	Machines employed.	Machines working together for 1 in. use, sq. in.	Machines in reserve for 1 in. use, sq. in.	Pressure per sq. in.	Form of tool employed.
Mont Ceniz	Sommellier's	10	7	90	Z
St. Gothard	Ferroux's Dubois & François. McKean	6	6-8	90	X
Musconetcong	Ingersoll's	6	—	60 70.	X [lar.
Maesteg	Beaumont's	2	—	50	Semi-circ.
Cwmbran	McKean's	2	1	70-80.	Flat tool.
Port Skewel.	Geach's	2	2	60-60.	X
Saarbrück	Sach's	—	6	60	Flat tool.
Ronchamp	Dubois & François.	4	1	67	X & Z
Bianzy	Darlington	4	none	45	Flat tool.
Minera	Darlington	1-2	none	50	Flat tool.
Ballacorkish.	Darlington	1-2	none	45	Flat tool.

CUT AND SINK.—In tunnelling or sinking shafts by means of rock-boring machinery it is necessary to conduct the operation in some special manner. When machines were first introduced into our mines the miner insisted upon employing them as a mere substitute for the borer and mallet, and boring the holes so as "to take advantage" of the ground. The result showed, however, that such a course was unsatisfactory. Not only was the time required to get a position for the machine, to fix, and to remove it excessive, but the work accomplished was not in proportion to its cost. The engineers of the Mont Ceniz Tunnel were the first to recognise the fact that if power machines were to be successfully adopted the hand method of doing the work must be discarded and new conditions established. A given number, ten machines, were accordingly grouped together on a carriage, the natural rupturing lines of the rock disregarded, the holes drilled more or less with the axial line of the heading, the machines and carriage withdrawn, the holes charged, the explosive fired, and the stuff removed.

These series of operations constituted an "advance," while in America and in one or two English mines it is known as a "cut," and in shafts as a "sink." At the time when the Mont Ceniz Tunnel

was driven nitroglycerine and dynamite had not been largely adopted for blasting purposes. Powder was the explosive used in the execution of that work; this, together with the great length of the machines and comparatively narrow width of the heading—9 ft. 10 in.—thereby limiting the angling range of the machines, rendered a considerable number of holes necessary for effecting the removal of the rock. A face of 83 1/2 square feet was perforated with from 60 to 70 holes, 2 1/2 ft. to 4 ft. deep. The Musconetcong Tunnel, New Jersey, was driven with the aid of dynamite. The advance heading, 8 ft. high, was carried the entire width of the tunnel—26 ft. With two boring carriages, and strongly angling the machines on a line from the top to the bottom of the tunnel towards its axial line, holes 10 ft. deep were made for bringing out the centre "cut." The methods of arranging the holes for blasting may be distinguished as—

- (a).—Mont Ceniz and St. Gothard.
- (b).—Musconetcong and Minera.
- (c).—Brain's radial system.

(a).—The face of the Mont Ceniz heading, allowing for contraction towards the top and rounding the corners, represented an area of about 80 square feet. This "face" was subjected to the attack of 10 machines, giving 8 square feet of surface per machine, or nearly one hole for each square foot of surface.

The centre of the face was perforated with a large hole and immediately outside of this centre eight other holes were bored, constituting the "centre or rupturing holes." Around this set of centre holes a series of three sets of concentric and two sets of semi-concentric holes were drilled. The holes were subsequently fired in volleys, and removed the rock—(1) the centre, and (2) the portion concentric to the centre. See Fig. 16.

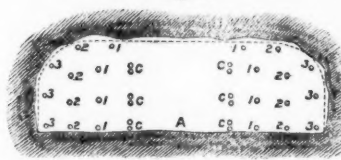
(b).—At Musconetcong the tunnel heading, 26 ft. wide, by 8 ft. high, gave a net area of about 175 square feet. This face was perforated with 36 holes by means of six powerful boring machines, each cylinder 5 in. diameter. The area of the face apportioned to each machine was 29 square feet. The number and depth of the holes to obtain a cut of 10 ft., or an actual lineal advance of 9 ft., were:

Cut	12 holes, each 10 1/2 ft. deep.
First square up	8 "
Second ditto	8 "
Third ditto	6 "
Four roof holes	2 "

Total ... 36

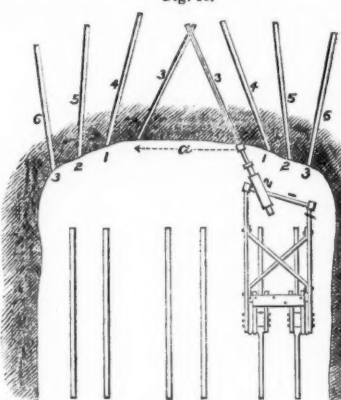
The aggregate depth of the 36 holes was 408 lineal feet; number of square feet of heading to one hole about 4-8-10ths. The following is Mr. Drinker's description of driving by the cut system:—"The method of blasting by cuts is based on the extraordinary force developed by a comparatively small bulk of explosive matter. It consists in first blasting out an entering wedge or core, about 10 ft. deep at the centre, and subsequently squaring up the sides by several rounds. To do this 12 holes are first drilled by six machines, three on a side, the holes placed as shown in Fig. 13, and marked

Fig. 13.



C; A being the floor of the heading. Then 12 holes are drilled, two and two, six on a side, with from 1 1/2 to 2 1/2 in. "bits," the two sets being started about 9 ft. apart, and at such an angle (see Fig. 17) as to meet or cross at the bottom, the largest bit being put in first. The holes are then charged with about 25 lbs. No. 1 and 50 lbs. No. 2 dynamite, and fired simultaneously by electricity. No. 1 is only used for cuts, inasmuch as in them a quick strong powder compressed in a small bulk at the bottom of the holes is required where the greater resistance will be found, while the No. 2 added serves in filling up the holes, so starting the sides of the cut as the apex moves—the cut, a, being out a second round of holes is

Fig. 14.



started for the first squaring up, as shown by the numbers 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, Figs. 13 and 14.

In these and the subsequent rounds, 2, 2, 2, 2 and 3, 3, 3, the resistance is pretty equally distributed along the whole length of the holes, and as it is not so great as in the cut, No. 2 is used, as in it the nitroglycerine, being mixed with a larger proportion of absorbent matter the force is thereby distributed over a greater space. In the first and second squaring up rounds from 50 to 60 lbs. of No. 2 are charged, and in the third from 60 to 90 lbs., the holes getting stronger as the arch falls at the side. There are generally, also, one or two additional roof-holes in the third round that are not shown in the figure, their position being variable, according to the lay of the rock. The top holes in the first round are also designed to bring down the roof not shaken by the cut, and are, therefore, given a strong angle towards the centre, and always drilled from 12 to 14 ft. deep. The plan, Fig. 14, shows the cut holes, 4, 5, and 6 the squaring up rounds.

As to the relative depth the holes of the first squaring round are always drilled a foot or more deeper than the cut-holes, and when blasted they generally bring out a foot additional of shaken rock at the apex of the cut.

(c).—BRAIN'S RADIAL SYSTEM.—This system, devised by Mr. W. Blanch Brain, of St. Anna's, Cinderford, was introduced about three years ago at the Drybrook Iron Mines, in the Forest of Dean. The main object of the inventor was to perforate the face of a level without once shifting the stretcher-bar when placed at its proper height. M. André, in his work on Coal Mining, thus notices the radial system:—"The fundamental principle which constitutes its distinctive character is to make the holes of a series to radiate from a fixed point. The object of this radiation is twofold—to utilise the face of the heading as an unsupported side, and to reduce to a minimum the time consumed in changing the position of the stretcher-bar. It will be obvious on reflection that if these ends are attained without incurring a compensating loss the merits of the system are beyond question, since their attainment leads to rapidity of progress, which is the main purpose of machine labour. It is evident that if the holes are made to radiate from a fixed point, and the horizontal position be avoided, none of them can be perpendicular to the face of the heading, and, consequently, the lines of fracture from each charge tend to reach this face. A consequence of this fact is that no unkeying of the face is necessary, since each

to the Van Mine, and, in fact, presents to an unusual extent the phenomena indicative of its being the top, or outlet, of an immense deposit of lead ore; and should it increase in value and the ore ground to lengthen at the same rate for another 20 years, as it has hitherto been found to do, it will produce results that cannot fail to establish it one of the cheapest and richest mines of the rich Lisburne district, enriching its proprietors and highly beneficial to the locality, while adding new ground for those interested in legitimate Cardiganshire mining to invest in.

CHAS. KNEEDONE.
Llanberis, Oct. 25.

THE CHINA-CLAY TRADE.

Sir,—I have read the letters of "Tourist" and "Fair Play" which have appeared in the Journal on this subject, and as I have carefully examined the districts where clay is produced, and as a result of that examination have been tolerably successful with the work I have taken in the district, I may perhaps be allowed to say a word or two. China-clay, like everything else, has its difficulties, but it is a sound and increasingly prosperous trade, and one in which money may be invested if only ordinary caution is exercised. Good clay is, however, not often to be had, and enquiries into the histories of the splendid things that are from time to time offered to the market, and are occasionally to be had on very easy terms; this is especially the case in dull times like the present, when the general public is disinclined to invest, and those who look ahead a little may manage to get hold of works which when good times come round will pay them the whole of their outlay in a very few years. Clay working partakes very little of the character of mining, being after all a fairly established almost entirely a commercial undertaking, depending for success on good management and an adequate working capital, and it is in the want of these two essentials that the difference is often to be found. There is this important difference, however, between a claywork and an ordinary commercial undertaking, that the profits are made by purchase and re-sale. In a claywork the cost of production—or, in other words, the purchase price—does not vary materially in good times or bad, and while there is generally a fair working margin for profit in bad times, in good times the profit is often very large as prices go up, and every extra shilling per ton realised will in most cases mean a considerable percentage on the capital invested.

J. FLETCHER PAGEN, C.E., F.G.S.
S. Austell, Oct. 24.

EPITOME OF MINES AND METALS—No. I.

Sir,—From the history of metals we can trace the history of industry and labour—metals from the most precious to the basest, from the rarest to the commonest, all play an important part in the history of nations. They are at present supposed to be upwards of 50 in number, the names and dates of their discovery are as follows:—

Metals.	Discovered by.	Date.
Aluminium	Wohler	1828
Arsenic	Brandt	1758
Antimony	Basil Valentine	1490
Bismuth	Agricola	1530
Barium	Davey	1808
Calcium	Davey	1808
Cadmium	Stromeyer	1817
Cerium	Hisinger	1803
Chromium	Vauquelin	1797
Columbium	Hatchett	1801
Cobalt	Brandt	1733
Copper	Known to the ancients.	
Didymium	Mosander	1840
Erbium	Mosander	1840
Glucinum	Wohler	1828
Gold	Known to the ancients.	
Iridium	Tennant	1803
Iron	Known to the ancients.	
Lanthanum	Mosander	1839
Lead	Known to the ancients.	
Lithium	Arfvedson	1817
Magnesium	Bussy	1829
Manganese	Gahn and Scheele	1774
Mercury	Known to the ancients.	
Molybdenum	Hielm	1782
Nickel	Cronstedt	1751
Niobium	H. Ross	1845
Osmium	Tennant	1803
Pelopium	Ross	1845
Palladium	Wollaston	1803
Platinum	Wood	1741
Potassium	Davey	1807
Rhodium	Wollaston	1803
Ruthenium	Klaus	1844
Silver	Known to the ancients.	
Sodium	Davey	1807
Silicium	Berzelius	1824
Strontium	Davey	1807
Tin	Known to the ancients.	
Thorium	Berzelius	1829
Tellurium	Muller	1782
Terbium	Mosander	1840
Tungsten	D'Elhuyart	1781
Titanium	Gregor	1791
Uranium	Klaproth	1789
Vanadium	Seftstrom	1830
Yttrium	Wohler	1828
Zinc	Paracelsus	1530
Zirconium	Berzelius	1824

[To be continued.]

The state of the Metal Market as regards tin and copper is steadily improving, giving fresh stimulus to all mining operations.

Carn Brea Mines: It is said that over 100 tons of tin per month have been raised.

Wheal Jane is reported to be looking better, and to be returning to its former state of tin per month.

Wheal Eliza continues to send 40 tons of tin per month to market. West Poldice: A man and boy recently got a "sturt" at this mine; but it was soon after they commenced working, and they have been fortunate to break tinstone in two months sufficient to produce 100 tons of black tin, which will give them for their share about 1800. This discovery has been made by a pair of tributers. As a rule, tributers should be encouraged—not so much tutored in the way as is too often the case now. The tributer is the "life of the mine," as a rule, he is a good practical miner; he is observing, cautious, and careful, whilst the tutwork man cares only for the number of fathoms he can drive (I have known rich ore buried in "stalls" by tutworkers). The tributer takes the greatest care of his mine, he becomes, so to say, an adventurer, working on sometimes without earning anything, yet he perseveres, and in the long run manages to do better than the tutwork man. It is a fact that many of the most successful captains were good tributers.

Wheal Rose: It is rumoured that this famed old mine is to be worked at once by an influential company.

J. H. JAMES.

GREAT HOLWAY MINE.

Sir,—In the interests of intending shareholders in the Great Holway Mining Company, I beg to call attention to the fact that the mine is to be given to the vendors of the property does not appear in the prospectus; and as I know the mine well, and am aware that it will in all probability take a very large capital to work the mine successfully, I consider it only right that the public should know what amount is to be given out of the capital for the purpose of acquiring the property, since in many instances companies have been proved to have commenced operations with only a small portion of the capital mentioned in their prospectuses subscribed, the greater part of which has found its way into the pockets of the vendors and promoters; and in the face of several important judge-

ments given with reference to disputes under the Limited Liability Acts, where it was laid down that—"Not only should a prospectus state everything with scrupulous accuracy, but that no fact should be omitted, the existence of which might affect the interests of intending shareholders"—I think most of your readers will agree that I am justified in calling attention to this matter, since it can hardly be denied that it is a question of vital importance to intending shareholders whether a large amount of the capital subscribed for concerns in which they purpose investing their money be paid for acquiring the same or not. [I enclose my card.] JUSTITIA.
Holywell, Oct. 23.

MINING IN MONTGOMERYSHIRE.

Sir,—Your correspondent "Cymro" finds fault with my remarks under the above head as being one-sided, and immediately instances Ystrad Eion Mine, which, unless my local knowledge extending over 30 years is at fault, is not in this county at all, but in Cardiganshire. There is no doubt a very fine plant of dressing machinery there, but where the mineral is to come from to dress remains to be seen. There is no doubt whatever about Hyddgen being a good mine, though unfortunately somewhat difficult of access to, but its western boundary does not adjoin the Cambrian Mines, or, if it does, only for a few yards; and the Esgair-fraith lode certainly does not go into that sett. There is no doubt, however, that Hyddgen is a promising mine, and in a district which is destined one day to acquire more notice in a mining sense than it has hitherto attracted. I sincerely trust the perpetrators of the outrage described by your correspondent will be brought to book. In my letter I intended to have used the word "private" enterprise as much as "local" enterprise, as compared with the unfortunate results of company mining. At the same time I must say that mining, as a rule, is more adapted for co-operative working than to be carried on single-handed.

Machynlleth, Oct. 20.

J. D.

THE CAMBRIAN MINES, CARDIGANSHIRE.

Sir,—Enterprises and projects—whether they be mining, railway, industrial, trading, mercantile, or commercial undertakings—are each and all comparative problems, and somewhat involved in obscurity at starting—hence should, when solved and recognised as successes, be thoroughly acknowledged, and the credit due to skill, perseverance, and merit rendered and awarded. In mining all authorities concede that there is far greater difficulty in defining with unerring certainty where chambers of mineral wealth are to be found in paying quantities "in metallic lodes" than it is to determine those veins which are barren of the properties essential (nay, indispensable) to success. The discovery of a rich deposit of copper or lead ores in any locality is a boon and blessing to society at large; the good effects permeate every circle of the community. The fortunate capitalist is no further benefited than are the hard working, industrious, labouring miner, the machinist, merchant, and shopkeeper; while the volume of trade and commerce is spread and augmented. The mine or mines themselves becoming soon recognised and acknowledged as profitable mediums for the employment of capital, and the greed of the general public stimulated to search the earth for similar prizes in its vast and boundless stores; these from time to time become discovered to refresh and reward the industry and enterprise of man. It is thus that labour and capital work hand in hand, and the boundless blessings of Providence are brought to light. The true philosophy of opposition is no less useful than discernible and is indispensable in all the arenas of life. It exists in commerce, manufacture, and trade; the Legislature, the Bar, and no less so in the Church itself; and, without this strife for eminence and position the spirit of progress and the development of intellect would succumb to the enervating laws of inaction. Activity and industry are ever identified with prosperity, and whenever success is attained the fact should never lie "hidden under a bushel." Hence it is with pleasure that we refer to the Cambrian Mines, in Cardiganshire, which promise rapidly to develop themselves into rich, extensive, and profitable copper and lead properties.

Still at this moment the philosophy of opposition is at work, and the greatest desire is evinced to stifle the merits and to retard the general recognition of the manifest "to experts and authorities" inherent worth of these mines. This is as it should be, for were the mines of no actual value or importance there would be no cause for the display of "opposition," nor any contention as to who shall possess the shares, or the price at which they may be obtained. We, therefore, in the face of these necessary—nay, most desirable—obstructions, "for they accord with the constitution and necessities of mankind," propose to refer somewhat in detail to the Dolcoath, Buller, Great Alfred, Treavean, Carn Brea, Cook's Kitchen, and the North Basset Mines; space will not admit of a reference to the great mines of Gwennap, Marazion, St. Blazey, Crinnis, and the Caradons, but in each and all the large deposits of copper ores were found under backs of rich crystallised gossans, and the longer and more extensive these gossans proved the greater and more profitable were the chambers of wealth below. At the Esgair-fraith, one of the Cambrian Mines, the gossan is upwards of 200 fms. in length, and in the shaft extends from high the surface down to the 23 fm. level below the adit or day level, but at this point a leader of rich copper ore from 3 to 4 ft. wide, worth 1000 per fathom, accompanies the gossan, and ends both east and west are now being opened out on its course—identical in character and composition.

Dolcoath, once famous for the yield of copper, and in its progress over a period of 40 years even more productive than the Devon Great Consols or Wheal Friendship, is a remarkable example of gossan backs above the deposits of mineral in depth; the copper ore was embedded in the clay-slate, as is the case at the Esgair-fraith. The first is now rich for tin, and the workings have attained a depth of over 750 yards, but, though the yield is as prolific as ever, the reduced price of the metal, consequent on the large imports from Australia, leaves little profit to shareholders. This mine has been at work for ages, and the present company is over 70 years old. There is no lack of mineral, but costs of production are heavy. Only five to six years ago, when the value of black tin ranged from 100 to 120 per cent. above ruling quotations, the dividends were close on 50,0000 a year, and the market value stood at 400,0000 for the entirety. Free trade and the tin discovered in our colonies will prove destructive to tin mining in Cornwall. Trade and manufacture is, however, advantaged to a far greater extent.

Treavean Mine is rich in gossans, though abandoned twice as a failure, realising profits close on 400,0000, was taken up by the late Captain Thomas Teague, who, with an outlay of about 100000, struck into a fresh deposit of copper ore, and immediately below a highly "crystallised gossan." Under different companies this mine divided 800,0000 profit. The last company returned, from 1814 to June, 1848, 397,970 tons of copper ore, realising 1,879,7350. The entire capital was 312000, and the dividends up to 1857 were 452,7900. The yield from 1848 to the suspension of the works we are unable at the moment to furnish—probably, 1,000,0000.

Carn Brea, upon an outlay of 15,0000, declared dividends of 298,0000. The deposits of copper ore were invariably found beneath rich "crops of gossan." This mine had on two former occasions been abandoned after making equally large returns and profits. In the early stages of mining it appears to have been the custom to exhaust one deposit of ore and then close up the works, leaving the field open for others to search and make fresh discoveries. The mine is now rich for tin.

Cook's Kitchen is only 300 fathoms in length, and rich gossans form the backs of the lodes throughout. The profits were 10000 per fathom; throughout (say) 300,0000. The copper was very rich, and like the Cambrian Esgair-fraith black and red oxides were supplanted by sulphurets in depth. The mine yields tin below the copper ores, but the workings of late have not been attended with more than occasional dividends, and those even at wide intervals. North Roskear upon a capital of 14000, gave dividends of 104,0000. North Basset without making calls gave dividends of 275,0000. This mine was well handled by the manager of the Cambrian, Captain Thomas Glanville, and was extremely rich in gossan. Hence we have great confidence in his judgment, as no man has had more experience in the exploration of gossan lodes than himself. His uncle, the late Capt. Joseph Lyle, was the discoverer of Carn Brea, North

Basset, West Basset, Great South Tolgus, and Relistian—all rich in gossans and copper. Capt. Glanville was his right hand man.

Great Wheal Alfred was peculiarly rich in gossans, and yielded gains of 300,0000 on a very trifling outlay. Wheal Fortune was equally rich in gossans and copper, and gave immense profits; and, in conclusion, we beg to subjoin a few of the most distinguished copper mines that have come under our personal observation since the year 1835, and so far as our experience extends we do not recollect a single instance of a rich copper lode in the absence of a gossan back.

GOSSAN AND COPPER MINES.

	Capital.	Dividends.		Capital.	Dividends.
Basset	£ 2,624	£ 326,913	North Basset	£ 14,700	£ 84,300
Beauchamp	—	120,000	North Pool	4,500	61,400
Brewer	1,924	10,000	North Roskear	1,400	102,000
Buller	1,260	350,000	Pennrathal	5,000	130,000
Carn Brea	15,000	306,000	Poldice	—	200,000
Clifford	—	92,583	Seton	22,166	69,201
Condurrow	8,960	20,992	South Frances	8,396	183,866
Cook's Kitchen	—	300,000	South Tolgus	4,096	38,144
Consol group of mines	—	1,199,388	Tincroft	54,000	299,000
Damsel	—	180,000	Ting Tang	—	50,000
Dolcoath	46,187	478,866	Treavean	3,120	454,422
East Crofty	11,750	78,960	Treskerby	—	200,000
East Pool	3,104	97,000	Trethellan	1,860	48,441
Esgrail	—	150,000	Treviskey	15,000	37,920
Gt. So. Tolgus	4,350	47,550	Unity	—	330,000
Jewel	—	250,000	West Basset	9,000	152,400
Maud	—	40,000	West Seton	19,000	163,600

We have to-day (Oct. 25) inspected a box of copper specimens which left the Cambrian Mines on the 23rd. They consist of black and grey oxides and rich sulphurets of copper. The lode has been opened out in the north end of the shaft, and a course of yellow and grey ores laid open 4 ft. wide, worth 1000 per fathom; then comes in 5 ft. of gossan, with three branches of black and grey oxides 2 to 4 in. wide, worth 3000 a fathom in addition. The ends both east and west are worth 1000 a fathom respectively; hence there is no doubt of the continuance of the ores. About 90 tons of the ores are at surface, and at least 100 tons will soon be ready for market.

The directors being satisfied with the permanent character of the discovery have decided on putting in skip and ladder roads and casing up the shaft, with cutting plates and putting in pent-houses so as to discharge the ores effectively and with economy, and as these latter operations will be on the course of the lode the ores will far more than pay the costs. In a month or six weeks the shaft will be sinking, and the 23 fm. level ends in full operation on a lode worth 1000 per fathom at each point. Should these pioneer operations continue equally good the Cambrian will soon prove the richest copper mine in Great Britain.

R. TREDINICK,
Consulting and Advising Mining Engineer.

Exchange, 66, Coleman-street, London, E.C., Oct. 25.

THE GOSSAN DEPOSITS AT THE CAMBRIAN MINES.

Sir,—I read in last week's Journal the remarks relative to the unfailing value of great gossan deposits. You will, perhaps, allow me to add other instances which have come under my own observation. When my uncle, the late Mr. Joseph Lyle, took in hand the old Carn Brea Mine, about 40 years ago, he was induced to do so by examining the large gossan deposit, impregnated with carbonate of copper, similar to that at Esgair-fraith Mine.

When very young I was employed at Carn Brea, and was a witness of the immense returns of copper ore in connection with the gossan. Again, at North Basset we had enormous quantities of gossan, which resulted in the production of the richest copper ever found in Cornwall. The immense profit made by this mine when under my management is well known, but I may mention as a remarkable fact that two men in this mine in six hours broke 15000 worth of ore. At West Basset we also had great deposits of ore in connection with gossan.—*Cambrian Mines*, Oct. 24. THOMAS GLANVILLE.

P.S.—It is stated in last week's Journal, by a correspondent signing himself "Old Miner," that the Cambrian Mines are under the joint supervision of Capt. Abalom Francis and myself—this is a mistake; I alone am responsible.

SOUTH CONDURROW, AND WHEAL GRENVILLE MINES.

Sir,—A letter having appeared in last week's Journal on the above mine, signed "Peter Provis," which from communications received I find is credited to me, being the only one in the district of the name of Provis, I hereby disclaim any knowledge of the letter or writer. As I am professionally engaged in several of our mines I make it a point to avoid all anonymous newspaper correspondence, and all business communications are signed with my usual signature—THOMAS B. PROVIS.
Camborne, Oct. 25.

SOUTH CONDURROW, AND WHEAL GRENVILLE.

Sir,—Although it may be true that the majority of the adventurers in the above mines may remain entirely unaffected as regards their judgment of the value of their property by the many amusing letters that appear from time to time in the Journal on the subject, still, for the sake of the minority who may be induced thereby to increase or diminish their holdings, I would call attention to a few of the inaccuracies in which Mr. Peter Provis, of Camborne, bases the advice he good naturedly offers us in his letter dated Oct. 16.

Firstly, as regards the management of South Condurrow, to which he thinks too much praise is awarded, suffice it to say that the adventurers in that mine are eminently satisfied therewith, and fully convinced it is as good as can be.

He then tells us why South Condurrow has been successful, and that the 72 and 82 fm. levels have been very productive, which is so far right enough; but omits all mention of the 60 and 93 fm. levels west, from which so much of our tin has come. He goes on then to tell us that the 93 fm. level as compared with the 72 and 82 is a poor one. Now, I happen to have kept a record of the value of the ends quoted weekly since January, 1875, and here subjoin the average quotation of each end since that time, which I think can hardly be said to bear out this statement:—

Level.	93 E	93 W	82 E	82 W	71 E	71 W	60 E	60 W
No. of weeks quoted	33	75	59	60	21	72	15	63
Average value	£11 8	10 8	11 6	13 6	10 10	10 2	8 7	11 9

Then, as to the length of time the ground is to last. If Capt. Rich puts it at 50 years he surely is perfectly justified in expecting to find as much good or paying ground horizontally as vertically, especially as Mr. Provis (who is evidently an authority) takes great pains to dissuade us from anticipating any benefit from sinking; and supposing the lode to continue as good on the average through the sett as we have already found it, we have certainly more paying ground than will go through our stamps in 50 years. His first statement in regard to Wheal Grenville is that "the best level in Wheal Grenville upon the South Condurrow lode has been the 130," and shortly after that, "that the 140 is not so good as the 130; the 150 not equal to the 140; and the 160—or deepest level—has been inferior to them all." Further on—"But what will fall into the South Condurrow lode at or about the 150 in Wheal Grenville is not a rich branch, but a poor lode that has never produced any mineral during the whole course of sinking upon it, and it will surprise me if it causes any improvement in the flat lode when it falls into it."

Now, has Mr. Provis forgotten—or did he ever know—that the 160 by the western shaft was valued at 1 ton of tin per fathom, and that it was there in junction with Grenville old lode, with which lode it is also expected to be found in connection with the 150, under the northern shaft. Further, that from this Grenville old lode has come seven eighths of the tin that Grenville has ever returned, and can he show us any quotation of the 130 of a value of 1 ton per fathom? He then proceeds to draw his conclusions, and tells us that the limits in which Grenville may expect to find the lode profitable are between the 130 and the boundary, and further on advises the driving of a cross-cut at the 120, &c., to prove the lode between the 120 and the point at which it enters the sett.

Now, as South Condurrow levels are reckoned from the adit, and Grenville from surface (a fact which Mr. Provis seems also to have forgotten), and as I believe the same adit is 30 fms. from surface, it follows that where South Condurrow has the lode at their 93, Grenville has it not at their 120, so that this lode between the 120

Dr. EVELEIGH, in seconding the motion, said, although accounts the expenditure on the hacienda for the six months

modious plat at the 80, and are now cutting top plat at the 90. We have also fixed a 32-in. plunger lift in place of the two buckets that were worked by the former company, and have placed the shaft and footway in good repair throughout. We have sunk the skip-shaft 5 fms. 4 ft. 3 in. below the 90, but had to suspend it in consequence of an increase of water. At the old engine-shaft we have fixed balance-bob at the 40, changed several defective pumps and clockworkings, and have also strengthened all the joints in the main rods from the top of the shaft to the bottom, and have put a 13-inch plunger at the adit in place of the 10½ inch, to give an increase of water for our dressing operations. At the surface, on the old floors, we have made a large reservoir, fixed portable engine, Colson's jigs, centrifugal pump, two round bidders, slime pits, &c., and made an incline for discharging the stuff from the crusher. At Gundry's new floors we have put in a high tramroad for bringing stuff from the shaft, sizing screens, jiggling hutches, picking tables, and sheds to cover the same. We have also fixed a weighbridge in a very convenient spot for weighing all the coals and stores that are required in the mine. We have 90 men working on tutwork and 30 men on tribute, and 42 men and 80 girls and boys at surface. Total, 242 persons employed.—J. GILBERT.

Mr. TAYLOR went on to say that the large quantity of work done in the mine showed that the ground was extremely favourable, and with the exception of the 30 fm. level, every level which had been driven had produced ore in paying quantities. So within the first period to which the accounts related, although they were not aiming at getting returns, yet the ore which had been got out in driving the various levels had been a very considerable assistance to the capital account. As to the present prospects, they must bear in mind this fact, that in these levels the course of ore was over 100 fms. in length, without any break. The lode does not produce such large quantities as was represented, but the difference was not so very great. When they came to stop down the ground which was laid open they found generally that the lode was in very many places opening up a much larger size than that which was seen in driving on the level, which was of the ordinary width of 5 ft. In stopping the lode had produced ore sometimes 7 to 8 tons per fathom. The engine-shaft was sunk by the former proprietors to the depth of 100 fathoms, and considerable levels driven. Everything indicated that the capabilities of the mine for producing large returns were very considerable, and everything was laid open in a way so that the mine could be worked to the greatest advantage. The two shafts would give complete mastery of the water. The old engine was one deserving of all praise, and was now in thorough good repair, and very powerful. But it had had an excess of work, because there was no communication between Gundry's shaft and the eastern portion of the mine. Gundry's shaft was a fine one, the 30-inch engine being as good as new, and the pitwork was at the present time capable of drawing to the surface a very large quantity of water, when we shall be able to bring the water to it, but at present the water did not require more than a stroke and a half per minute to keep it under, and communication had been almost completed between the two shafts, and would be entirely completed about next month or December, and then they would be able to divide the water between the two engines. As regarded the western portion of the mine, they had good levels in the 60 and the 70, but in the 80 they had got into a hard piece of ground, and the lode was impoverished, but he had hopes that this was only a floor. At present large returns of ore were not being made, inasmuch as they were not in a condition on surface to deal with it, the crushing and dressing machinery not being sufficiently extensive and powerful. The directors had thought it better to defer any further outfit of new machinery for dressing apparatus beyond that which they had already provided, and which was equal to preparing a return for market of 400 tons, until it was satisfactorily ascertained as to where the principal point would be where the ore would be dressed. Instead of the old mode of dressing the directors had prepared Colson's jiggers, two bidders, and a centrifugal pump. In conclusion, Mr. Taylor gave some minute details relative to the working of the mine.

On the motion of Mr. KINGSFORD, seconded by Mr. HOWARD, a vote of 100% was passed to the directors for their services to June 30.

In seconding this motion, Mr. HOWARD (who was the chairman of the late company) expressed himself as extremely satisfied at the manner in which the mine had been worked, and with the present position of affairs, which reflected great credit on Mr. Taylor, adding that it was the more gratifying to him as he was one of the vendors of the property, as it proved that their estimate of the value of the mine had not been overrated.

The CHAIRMAN, in acknowledging the vote which had been passed, said that it was particularly agreeable to hear expressions of satisfaction from the vendors.

The retiring auditor, Mr. Charles Harbatt, was re-elected, and his remuneration fixed at 5% for each audit.

On the motion of Mr. R. TAYLOR, seconded by Mr. KINGSFORD, a vote of thanks was passed to Capt. Gilbert and the other agents, and, after a cordial vote of thanks to the Chairman, the meeting broke up.

NORTH TREKERRY.—At the meeting on October 16 the accounts showed a debit balance of 638l. 4s. 9d. A call of 10s. per share was made. Dr. Whitworth was appointed purser, at a salary of 8l. 8s. per month; Capt. John Nancarrow was appointed the manager, at a salary of 5l. 5s. per month; and Capt. Alexander Nancarrow confirmed in his appointment of resident agent, at 6l. 6s. per month.

WHEEL OWLES.—At the meeting, on Oct. 19, the accounts showed a debit balance of 21,614l. 9s. 3d. Work performed during the 16 weeks:—133 fms. 3 ft. 11 in. driven, and 36 fms. 2 ft. sunk in shafts and winzes; 38 pares stoping for tin on tutwork, and 11 pitches working on tribute. Mr. Richard Boyns, the manager, says:—"If the Board of Trade Returns respecting the imports of tin for nine months of this year may be taken as a clue to the price we may reasonably expect an advance soon. In the accounts passed to-day, as has been invariably done from the commencement, every item is charged up; and I am glad to say the mine is in good working order."

CATHEDRAL.—A preliminary meeting of the principal shareholders in the Cathedral Mining Company (Limited), now in liquidation, was by the invitation of Mr. Laby (who had purchased from the Stannaries Court that company's interest in the lease and plant) held on Thursday at Mr. Ashmead's office, Cornhill. The object of the meeting was to discuss as to the formation of a new company to continue the working of the mine, which had been suspended by the liquidation. Nearly 6000 out of the 12,392 shares in the old company were represented. After discussion a committee was chosen to consider the best means for constructing the new company, and to report to a future meeting. The prospects of the mine were spoken of as exceedingly good, and it was considered that with the outlay of a small amount of capital expended in sinking the shaft to a greater depth, and erecting an adequate steam-engine for pumping, the mine would become very remunerative.

[For remainder of Meetings, see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

Political excitement has rather interfered with the course of the French iron trade, just as it has checked business in the French coal trade. Intending purchasers, or supposed intending purchasers, have maintained an attitude of expectation, and this is, perhaps, the worst of all difficulties which can befall a market which only lives on from day to day. The foundries of the Ardennes and the Haute-Marne are still working pretty well, and as a consequence casting pig has a fairly sustained market. Refining pig has not been held quite so firmly, but still it is in better request than might, perhaps, be anticipated. Working operations are being carried on tolerably well at Paris, but there has been, upon the whole, rather less activity in affairs. Negotiations are proceeding with reference to a treaty of commerce between France and Spain. A contract has been let at Rochefort for a small lot of steel rails and accessories required to meet the requirements of the French navy. MM. Schneider and Co., of the Creusot works, obtained the order upon the following terms:—Straight rails, 9l. 4s. per ton; curved rails, 9l. 12s. per ton; and fish-plates, 12l. per ton.

Enquiries as to prices have been received tolerably freely of late in the Belgian iron trade, but these enquiries have not been attended at present with much practical business results. The John Cockerill Company is building 30 iron pontoons for bridges of boats. It is stated also that 95,000 muskets are being made at Liège. Both these orders have been received from the Russian Government, and they are to be executed with the utmost possible dispatch; this last condition is one which does not involve much hardship just at present to industrialists, as a long continued scantiness of orders has left part of their plant and a number of their workpeople more or less idle. Large orders for rails and railway rolling stock appear to be out of the question just now in Belgium; industrialists have to content themselves with orders for small lots of 100 tons (and even less) of fish-plates, bolts, and miscellaneous accessories; and even such orders as these are not obtained without a good deal of competition. The Belgian Minister of Public Works has let a contract for 75 tons of iron fish-plates without bolts for ordinary Vignoles rails, payment to be partly made in old materials. The lowest tender was that of M. Boucquillon, of La Louvière, who offered to supply the fish-plates at 5l. 6s. per ton, and to take old rails in exchange at rates ranging from 3l. to 3l. 4s. per ton. A contract for 100 tons of bolts, to be partly paid for in old materials, was tendered for by seven firms, at rates ranging from 11l. 8s. to 11l. 12s. per ton. It may be noted that 1000 tons of old iron Vignoles rails of Belgian manufacture have been taken over from the State railways at 2l. 19s. 5d. per ton. Another lot of 1500 tons of old iron Vignoles rails of English manufacture made 2l. 9s. 10d. per ton.

Transactions in the French coal trade have been a good deal interrupted by the French elections, and the quietness in affairs has

also been increased by the fact that the weather has remained comparatively mild and open. Upon the whole, it may be said that the situation has continued much the same as it was a week since. A good deal of coal has arrived at Paris, especially coal for heating purposes. In the Nord and the Pas-de-Calais household qualities of coal have been in the most request, and an advance is already spoken of as probable. Prices upon the whole remain, however, simply firm; at the most it is only for exceptional qualities that an advance of 10d. per ton is stipulated for. The Carmaux Mines Company will pay on the 2nd prox. an interim dividend for 1877 at the rate of 1l. 4s. per share. The Mokta-el-Hadid Magnetic Iron Minerals Company will pay on Nov. 2 an interim dividend for 1877 at the rate of 5 per cent. per annum.

As is usually the case at this period of the year, deliveries of coal are being made more actively in Belgium, as winter supplies are being laid in as well by water as by railway. Trucks are already obtained with some difficulty upon the railways, as the conveyance of beetroot employs a good many. Household coal has been in strong demand, and has been forwarded to some extent to Paris. Orders for coal from the North of France do not also absolutely make default in Belgium; and, upon the whole, there is some return of activity to the trade, and stocks are declining. Quotations do not revive, but they exhibit a certain tendency to firmness. Industrial coal has been in comparatively little demand, and a disinclination is shown to conclude contracts for a long time in advance. New works for the production of briquettes have been established at Couillet. The La Haye Collieries Company, at Liège, will pay, on Nov. 2, a second dividend for 1876-7 at the rate of 1l. 8s. per share. The Bonne Espérance Colliery Company was worked at a small loss in 1876-7, but the loss was unimportant—only 135l. The Carnières Sud Colliery Company was worked in 1876-6 at a loss of 6110l.; in 1876-7 the aspect of the company's affairs did not improve, a fresh loss of 7145l. having been sustained. In the last two years the company has thus lost about 14 per cent. of its capital.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

MINERA MOUNTAIN LEAD MINING COMPANY (Limited).—Capital 100,000l., in 5l. shares. To acquire and work the Minera Mountain Mines, better known as the South Miners and Pool Park Mines, at Minera, Denbigh. The subscribers (who take 50 shares each) are—Adam Eytton, Lancashire, near Holywell, lead smelter; E. Thompson, Plas Avenue, near Mold, colliery proprietor; A. O. Walker, Leadworks, Chester, lead merchant; E. Williams, Elm House, Wrexham; T. J. Boward, Broom House, Didsbury, merchant; A. G. Godolphin, Sweeting-street, Liverpool, stockbroker; G. Coomer, Clarendon Buildings, Liverpool, cotton broker; P. Walker, Wrexham, brewer. The directors are—Messrs. A. O. Walker, P. Walker, E. Thompson, T. J. Bolland, E. Williams, G. Coomer, the qualification being the holding of 50 shares.

LONDON AND PALATINE FIRE INSURANCE COMPANY.—Limited by guarantee to 100l. To insure property of every description against loss by fire. The subscribers are—John Walsley, Over Darwen, Lancashire; Thomas H. Hurrell, Hulme Hall, Hulme; W. Shipley, Brookfield, Glasgow; W. Higginbotham, Ashton-under-Lyne; W. H. Herrington, New Wandsworth; H. Perry, Gravesend; N. Barrow, Kingston-on-Thames. The office of this company will be in Manchester.

DIAMOND WOOD PAVING COMPANY (Limited).—Capital 50,000l., in 5l. shares. To carry out improvements in the paving of roads, &c. The subscribers (who take one share each) are—Mr. Anstruther, 83, Oxford-terrace, W.; W. T. Raymond, 5, Old Jewry; J. W. Chambers, 8, Crawshaw road; T. B. Leewing, 10, Coleman-street; J. Bennett, 7, East India-avenue; W. F. Billings, Gibson's Hill, Newcastle; F. C. Bennett, 4, Queen Anne's Gate.

MURDOCH'S PATENT (Limited).—Capital 2000l., in 10l. shares. To work an invention for removing the incrustation from boilers.

PURE CARBON GAS COMPANY (Limited).—Capital 50,000l., in 5l. shares. To acquire the interest in Symes' Patent, and to work the same. The subscribers (who take one share each) are—George Symes, Oxford-street, Stepney; Charles Const, 9, Long-lane, Bermondsey; G. Mellish, 141, High-street, Shadwell; C. Morgan, 73, Marquess-road, Canonbury; W. H. Holman, Hampstead House, Hampstead; E. T. Smith, the Cedars, Putney; J. Smith, 17, Queen Victoria-street.

TRANSVAAL AND SOUTH AFRICAN COLONISATION AND TRADING COMPANY (Limited).—Capital 40,000l., in 10l. shares. To further the progress of South African colonisation, and to trade with that portion of the Continent of Africa. The subscribers are—J. G. W. Brook, 10, Cannon-street; T. L. B. Edgcomb, Claremont-place, Brunswick-square; F. A. Jenner, 6, Belgrave-road, St. John's Wood; W. J. Oliver, 2, Post's Corner, S.W.; A. J. Yar, 123, Abbey road, St. John's Wood; W. Sharp, 150, Abbey-road; B. Lawes, 24, Sackville-street, Westminster.

BARAGAH OIL REFINING COMPANY (Limited).—Capital 30,000l., in 5l. shares. To purchase lands in an oil producing island, called the Outer Baragah, British Borneo. The subscribers are—G. Adams, Great St. Helens, 50; W. H. Gade, 5, Trinity-square; R. S. Druck, 5, Trinity-square; 20; T. E. D. Plum, Mansion House Buildings, 10; C. M. Pletsticker, Sydney-terrace, Kilburn; A. Smith, 241, New North road; J. G. A. Rocks, 11, King-street, E.C. 5.

METROPOLITAN DISTRICT ESTATES COMPANY (Limited).—Capital 25,000l., in 10l. shares. This is a land and building company. The subscribers are—W. H. Herrington, New Wandsworth; 10; N. Barrow, Kingston; 1; T. E. Rickard, Winchester road, Bromley; 1; J. Tatlock, 4, Paper Buildings, Temple; 1; W. A. F. Armstrong, 2, Redcliffe Villas, Redcliffe-road; 1; H. Percy, Field Lodge, Gravesend; 1; James Beal, 20, Regent street, 10.

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week the market has been quiet but firm. The cheerful feeling now observable in the reports from the principal trade centres, both at home and particularly in the United States, may for obvious reasons take some time to react on the share markets in encouraging extensive transactions, accompanied by a rise in prices, but that it must do so, and that, consequently, the time has passed when investors need wait on any reduction in prices, are facts which they can reasonably be no doubt. In shares of iron and coal concerns the principal movement for the week is in Cairnabla, which are in demand at 15s. advance, owing to the discovery referred to below. Bolckow, Vaughan, A. are also 5s. higher, while Nant-y-Glo and Blaenau (pref.) are reduced 15s. Ebbw Vale 7s. 6d., Marbella 6s., Monkland 3s., and both classes of Glasgow Port Washington each 2s. 6d. Benhar are still freely offered. The Scottish Australian Company's sales of coal from Aug. 1 to Aug. 29 were 12,000 tons. Andrew Knowles and Sons are at 5s. prem.; ditto (25l. paid), 20s. premium. Antrim, A. 42s. 6d.; ditto B. 40s. Bilbao, 22. Bolckow Vaughan, A. 60s. to 70s. prem.; ditto B. 34 to 34½. Chillingham, 70s. to 80s. Darlington, 11½ dis. Nant-y-Glo and Blaenau (pref.), 20½. North of England, 3s. to 4s. Pelsall, 11½ dis. Silkestone and Dodworth, 20 dis. Skerres, 5½. Staveley, C. 83. Tredegar, A. 11 dis. Ulverston, 6 dis. Workington, 15½. West Cumberland, 8.

In shares of foreign copper concerns Canadian is 2s. lower, and Tharsis 1s. 3d., while Huntington is in better request at a small advance of 3d. (28s. 6d. to 30s.). Tharsis will be quoted ex div. on Saturday first. Hultafors are at 5½. New Quadrado, 40s. Panulicillo, 32s. 6d. to 37s. 6d. Rio Tinto Five per Cent. 56½. Yorke Peninsula (ordinary) 4s. to 6s., ditto (preference) 17s. 6d. In shares of home mines, Glasgow Caradon (old) shares are 1s. lower, and both classes of shares now stand at par, for the first time for many years. The company's sale of 2½ tons of copper ore on the 18th instant realised 904l. 13s., or an average of nearly 77s. per ton, compares with 195 tons at 62s. 11d. last month; in the corresponding month of 1876 the sale was 245 tons, at 90s. 10d.; of 1875, 245 tons, at 113s. 9d.; of 1874, 245 tons, at 102s. 1d.; and of 1873, 3½ tons, at 99s. 5d. A recovery in the price of copper will, therefore, make a great change to this company. Tin shares continue firm and scarce, and have a great margin to rise. A meeting of Wicklow Copper Company is to be held on Oct. 30. Cambrian shares continue to attract attention.

The "BURLEIGH" ROCK-BORING COMPANY (LIMITED).

100, KING STREET, MANCHESTER.

RICHARD MOTTRAM, Secretary.

For the Sale of the "Burleigh" Rock Boring Machinery; and also for Sinking Shafts, Cutting Tunnels and Levels, and General Rock Blasting Operations by Contract.

References permitted to—

Messrs. BOLCKOW, VAUGHAN, AND CO. (LIMITED), Middlesbrough.

" THE DOWLAIS IRON COMPANY (LIMITED), South Wales.

" THE EBBW VALE STEEL IRON, AND COAL COMPANY (LIMITED), South Wales.

" THE GRIMLIVADUOK WORKS COMPANY (LIMITED), South Wales.

" T. T. J. WALLER, Esq., Railway Contractor, Gisburn, near Skipton.

" TURNER AND SON, Limestone Quarries, Kiverton Park, near Sheffield.

CATALOGUES AND PRICE LISTS OF MACHINERY FORWARDED ON APPLICATION TO THE COMPANY'S OFFICE.

Bampfylde are at 6s. Borehaven, 7s. 6d. Carn Brea, 3s. Combmarin, 6s. 21½. Great West Van, 3s. 6d. Gunnsale (Clitters), 25s. 6d. Great Lacey, 21½. Kilfrith, 3s. 6d. Leadhills, 4½ to 5½. Llangan, 50s. Killalee, 25s. 6d. Mining Company of Ireland, 97s. 6d. North Lacey, 12s. 6d. Medlyn Moor, 10s. Wheel Agar, 7s. 6d. South Condurrow, 8½ to 8¾. Tincroft, 14½. Van Combs, 10s. In shares of gold and silver mines Richmond, 85, 900. Almaden, 50s. per share. Antioquia, 12s. 6d.; Birdseye Creek, 10s.; Cedar Creek, 60s.; Elbera, 25s.; Emma, 1s. 3d.; Exchequer, 5s. to 7s.; Flagstaff, 42s. 6d.; Elbera, 25s.; Hunter Silver, 5; L.X.L., 6s. to 7s.; Javali, 7s.; Last Chance, 17s. 6d.; Zealand Kapanga, 27s. 6d.; Fostera, 4s.; Santa Barbara, 25s. to 26s.; St. Del Rey, 330; South Aurora, 4s.; Teocoma, 7s. 6d.

Shares of oil companies continue steady, the only movement being a rise in 1s. 3d. on Young's Paraffin, and a reduction of 2s. 6d. on Uphall. A small time share is now being floated called the Broxburn.

In shares of miscellaneous companies business is still quiet. There is a rise in 2s. 6d. on Phospho-Guano (10½ to 10¾); Earle's Shipbuilding, 28 dis.; General Sewage, 5 dis.; Hopkins, Gilkes, and Co., 2½ dis.; Lang Chemical, 7s. 3d.; Lawe's Chemical, 7; Miner's Safe, 7½; Newcastle Chemical, 61s. 3d.; Phosphate Sewage, 5s. to 10s., and Scottish Wagon, 11¼—small done at 11½, however.

CAIRNABLA GAS COAL COMPANY (Limited).—Owing to diminished supply of the valuable Torbanehill mineral, the new field of it by this company on their lands in the parish of Glasgow, is of considerable importance. Professor Wallace, geologist for the City of Glasgow, has now made an analysis of it, which is a very fine sample of the Cairnabla Gas Coal Company, and a practical assay from the Cairnabla Gas Coal Company (Limited), Glasgow, and has obtained the following practical results:—Gas per ton of coal at 60° Fahr. and 20" vacuum, 14,080 cubic feet; illuminating power, in standard sperms candles, 1000 consuming 3½ cubic feet per hour at 8 inch pressure, calculated to 5 cubic feet per hour, 41.28 candles; value of one cubic foot of gas in grains of sperms, 99½ grains; equivalent of a ton of coal in pounds of sperms candles, 199 lbs.; duration of one cubic foot of gas by 8 inch flame, 78 min. 15 sec.; gravity of the gas, 0.450; this coal resembles the celebrated Boghead coal of Torbanehill more closely than any other gas coal hitherto found in Scotland, and of about equal value, the quantity and quality of the gas being very nearly to that of the original Boghead, while the coke, instead of being useless, is only 15½ per cent. ash.

YORKE PENINSULA MINING COMPANY (Limited).—According to the report this month from this company's properties, the mines were never so good as now. The ore shipped to this country, valued at 3085l. net, while the ore on hand is estimated at 5000l. net. If the mine continues to improve as it has done, and the inevitable rise in copper comes on, the ordinary shares will be thought too dear at 50s. each, in place of only being occasionally dealt in for weeks, as at present, somewhere about 5s.

Subjoined are this week's quotations, &c., of mining and metal shares quoted in the Scotch Stock Exchanges:—

Capital.	Dividends.	Description of shares.
Per share.	Rate per cent. up. Paid Previous. Last.	
£10	4	COAL, IRON, STEEL.
10	4	Arncliffe Coal (Limited)
10	10	Benhar Coal (Limited)
10	10	Ditto
100	50	Bolckow, Vaughan, and Co. (Lim.)
10	10	Cairnabla Gas Coal (Lim.)
10	10	Chillingham Iron (Limited)
32	29	Ebbw Vale Steel, Iron, and Coal (Lim.)
10	6	Fife Coal (Limited)
10	10	Glasgow Port Washington Iron & Coal (Lim.)
10	10	Ditto Prepaid
10	10	Lochore and Caplethrae (Limited)
10	10	Marbella Iron Ore (Limited)
10	10	Monkland Iron and Coal (Limited)
10	10	Ditto Guaranteed Preference
100	100	Nant-y-Glo & Blaenau Ironworks (pref.)
6	6	Omoa and Cleland Iron & Coal (L. & B.)
1	1	Scottish Australian Mining (Limited)
1	1	Ditto New
1	1	Shotts Iron
Stock	100	nil

Capital.	Dividends.	Description of shares.
Per share.	Rate per cent. up. Paid Previous. Last.	
4	4	COPPER, SULPHUR, TIN.
10	7	Canadian Copper and Sulphur (Lim.)
1	1	Cape Copper (Limited)
1	15	Glasgow Caradon Copper Mining (Lim.)
1	15	Ditto New
10	9½	Huntington Copper and Sulphur (Lim.)
25s.	25s.	Kaunda Mining (Limited)
10	10	Panulicillo Copper (Limited)
10	10	Rio Tinto (Limited)
20	20	Ditto 7 per cent. Mortgage Bonds
100	100	Do. 5 p.c. Mor. Bonds (Sp. Con. Bds.)
10	10	Russia Copper (Limited)
10	10	Tharsis Copper and Sulphur (Limited)
10	7	Ditto New
1	1	Yorke Peninsula Mining (Limited)
1	1	Ditto 15 per cent. Guaranteed Pref.

GOLD, SILVER.

Capital.	Dividends.	Description of shares.
Per share.	Rate per cent. up. Paid Previous. Last.	
1	1	Australian Mines Investment (Limited)
5	5	Richmond Mining (Limited)

OIL.

Capital.	Dividends.	Description of shares.
Per share.	Rate per cent. up. Paid Previous. Last.	
10	7	Dalmeny Oil (Limited)
1	1	Oakbank Oil (Limited)
1	1	Ditto
10	10	Uphall Mineral Oil (Limited)
10	10	Ditto "B" Deferred
10	10	West Calder Oil (Limited)
10	8½	Young's Paraffin Light & Mineral Oil (Lim.)

MISCELLANEOUS.

Capital.	Dividends.	Description of shares.
Per share.	Rate per cent. up. Paid Previous. Last.	
50	25	London and Glasgow Engineering & Shipbuilding (Limited)
20	14½	Peruvian Nitrate (Limited)
7	7	Phospho Guano (Limited)
10	10	Scottish Wagon (Limited)
10	4	Ditto New

† Interim. ‡ Per share.

Last day for this account, Oct. 26; settling day, Oct. 30.

NOTE.—The above lists of mines and auxiliary associations are as full as ascertained, Scotch companies only being inserted, or those in which investors are interested. In the event of any being omitted, and parties desiring quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate to the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, Oct. 25.

ANOTHER CURE OF INFLAMMATION OF THE THROAT.—(this week).—Mr. Heron, 10, Arthur-street, Belfast, writes:—"On October 1st, Dr. Loeck's Pulmonic Wafers allayed the inflammation of my throat, the cough, and gave me ease at once." They taste pleasantly. Price 1s. 2s. 9d. per box.

HOLLOWAY'S PILLS.—These celebrated pills are essentially useful in the blood, cleansing the stomach, gently stimulating the kidneys, and mild aperients. A few doses of this purifying medicine set the functions right, remove all bilious symptoms, steady the circulation, give strength to muscles and composure to the brain and nerves. The pills are so innocuous that they may be taken by persons in the most delicate state of health, and with the most delicate effect. When the system has been enervated by over-indulgence in mercurial preparations, these pills are excellent restoratives, they cleanse the blood and enrich it.

AWARDED THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

HADFIELD'S STEEL FOUNDRY COMPANY,

ATTERCLIFFE, SHEFFIELD,

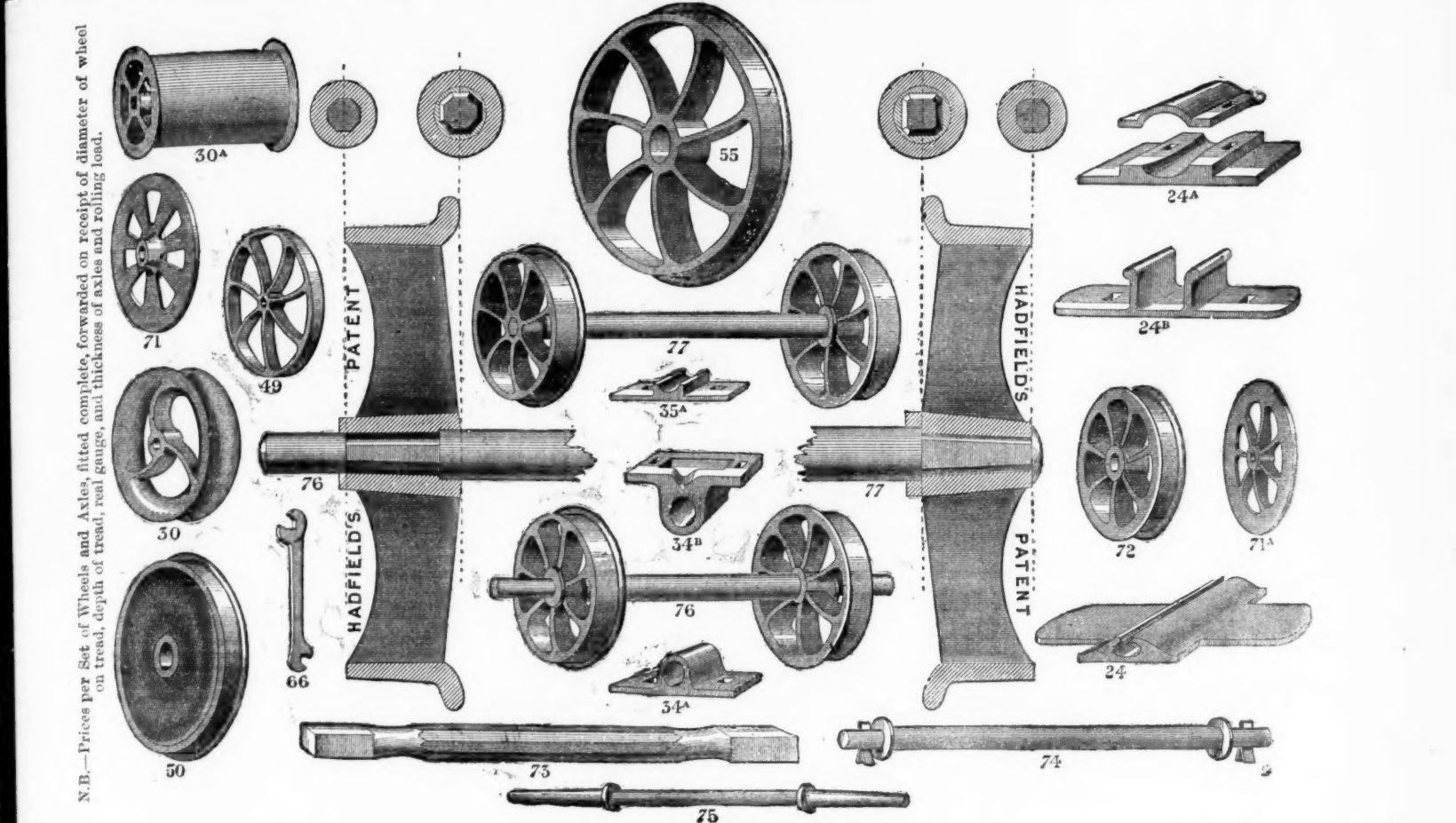
DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS, for Engineering and Machine Purposes,

AND ARE THE SOLE MAKERS OF

HADFIELD'S CRUCIBLE STEEL WHEELS.

One of our departments is specially adapted for the manufacture of these Wheels (as shown below), for Collieries, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., &c. We have made, and are now making, many HUNDRED THOUSANDS; and having Patented a New Method of Fitting Wheels upon axles, being cheap, effective, and expeditious, we can execute orders entrusted to us with promptitude, our capacity in this department alone being equal to about 2000 wheels per week.



HADFIELD'S PATENT METHOD OF FITTING WHEELS UPON AXLES.

The advantages of the above system are that the Wheels being forced upon a Taper Square-ended Axle, by Machinery, and then riveted (the machine securing truth), it is impossible that they can come loose or get within gauge. They are very cheaply fitted on, and run exceedingly true. The Arms of wheels upon the curved principle (as shown in the drawings above), consequently the shrinkage or cooling of the Castings is not interfered with, thus securing the greatest advantages of our very strong material. CRUCIBLE CAST-STEEL WHEELS, when cast by us, are made from one-third to one-half lighter than Cast-Iron. They cannot be broken while working, even with rough usage, and will last at least twelve times as long as Cast-Iron, thus saving animal and steam power, and reducing wear and tear immensely. We would also draw special attention to our INCLINE PULLEYS and CAGE GUIDES, the adoption of which will prove highly advantageous.

[This Sheet of Drawings is Copyright.]

MALLEABLE IRON CASTINGS,

Every Description.
W. B. MAPPLEBECK, JUN.,
21 AND 22, LOVEDAY STREET,
BIRMINGHAM.

LOCOMOTIVE TANK ENGINES

MAIN LINE TRAFFIC, SHORT LINES COLLIERIES,
CONTRACTORS, IRONWORKS, MANUFACTURERS, &c., from a superior
material, and their first-class Railway Engines, and special adapted to
heavy gradients, may always be had at a short notice from—
MESSRS. BLACK, HAWTHORN, AND CO.,
LOCOMOTIVE, MARINE, AND STATIONARY ENGINE WORKS,
GATESHEAD-ON-TYNE.

G. HUTCHINSON AND CO.,

FORTH BANKS OIL WORKS,
NEWCASTLE-ON-TYNE,
For the attention of COLLIERY OWNERS and ENGINEERS to the Oils
used in their special process. They never clog nor corrode, but keep the
engines clean, and will be found the best and most ECONOMICAL
OILS at present in the market, being very DURABLE, UNIFORM IN
QUALITY, and CHEAP. Prices, from 2s.
SPECIAL ADVANTAGEOUS RATES FOR LARGE CONSUMERS.
We may be mentioned Sir W. Armstrong and Co.; Edwicks Engine
Works, Newcastle; R. Stephenson and Co., Engineers, Newcastle;
F. Hawthorn, Engineers, Newcastle; Hawkes, Crawshaw, and Sons, En-
gineers, Gateshead-on-Tyne; Abbot and Co., Engineers, Gateshead-on-Tyne.
For prices, &c., on application. AGENTS WANTED.

J. J. ARIS AND CO.,

ENGINEERS, MINERAL AND METAL MERCHANTS,
29, FENCHURCH STREET, LONDON, E.C.
Mines inspected and reported upon.

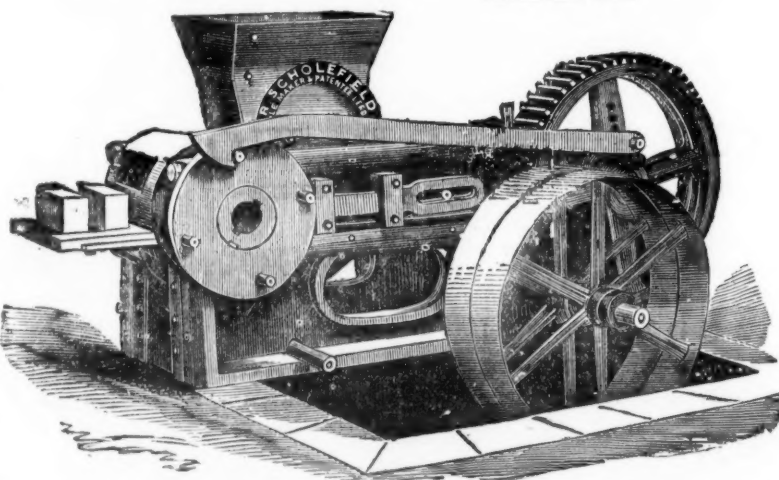
ACCIDENTS BY FLOOD AND FIELD

ACCIDENTS OF ALL KINDS
May be provided against by a Policy of the
RAILWAY PASSENGERS' ASSURANCE COMPANY.
LARGEST ACCIDENTAL ASSURANCE COMPANY.
Hon. A. KINNAIRD, M.P., Chairman.
Subscribed capital, £1,000,000. Annual income, £205,000.
£1,120,000 have been paid as compensation.
In case of death by accident, and a weekly allowance in the event
of being secured at moderate premiums.
Bonus allowed to insured of five years' standing.
The Clerks at the Railway Stations, the Local Agents, or—
64, CORNHILL, LONDON.
WILLIAM J. VIAN, Secretary.

R. SCHOLEFIELD'S

LATEST PATENT BRICK-MAKING MACHINE.

PATENTED 1873.



R. S. begs to call the attention of all Colliery Owners in particular to his PATENT SEMI-DRY BRICK MACHINE, and the economical method of making bricks by his patent machinery from the refuse that is taken from the pits during the process of coal-getting, which, instead of storing at the pit's mouth (and making acres of valuable land useless), is at once made into bricks at a very small cost, by R. S.'s Patent Brick-making Machinery. If the material is got from the pit hill, the following is about the cost of production, and the hands required to make 10,000 pressed bricks per day:—

2 men digging, each 4s. per day	...	£0 8 0
1 man grinding, 4s. 6d. per day	...	0 4 6
1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day	...	0 2 0
1 boy greasing, 1s. 6d. per day	...	0 1 6
1 engine-man, 6s. per day	...	0 5 0
1 man wheeling bricks from machine to kiln, 4s. per day	...	0 4 0
Total cost of making 10,000 pressed bricks	...	£1 5 0, or 2s. 6d. per 1000.

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

N.B.—Where the material can be used as it comes from the pit, the cost will be reduced in digging. As the above Machinery is particularly adapted for the using up of shale, bind, &c., it will be to the advantage of all Colliery Owners to adopt the use of the said Brick-making Machinery.

THE MACHINES CAN BE SEEN IN OPERATION AT THE WORKS OF THE SOLE MAKER AND PATENTEE DAILY.

SCHOLEFIELD'S ENGINEERING & PATENT BRICK MACHINE WORKS

KIRKSTAL ROAD, LEEDS.

ORMEROD, GRIERSON, AND CO.,

ST. GEORGE'S IRONWORKS, MANCHESTER,
Engineers, Millwrights, & Boiler Makers,

MANUFACTURERS OF

Stationary Steam Engines and Boilers for all purposes, Mill Gearing, Sugar Machinery, Cranes, Turn-Tables, and Railway Fixed Plant of all descriptions; also, the Diamond Rock Boring Company's Plant—viz.: Compressed Air and Air-Compressing Engines, Prospecting Machines, Tunnelling Machines, and Shaft Sinking Machines.



Porter's Governor for Stationary Engines. Also Governors on the same principle adapted for Marine Engines.

HYDRAULIC PRESSES OF VARIOUS KINDS

Have the Largest Assortment in the Trade of

PATTERNS,

WITH MACHINE-CUT TEETH, OF

SPUR WHEELS, BEVEL WHEELS,
MITRE WHEELS,

ALSO

FLY WHEELS.
DRIVING PULLIES & DRUMS,

CAN BE SUPPLIED BORED AND TURNED IF REQUIRED.

CATALOGUES ON APPLICATION.

LONDON OFFICES:

No. 5, WESTMINSTER CHAMBERS,
VICTORIA STREET,
WESTMINSTER, S.W.

BROADBENT'S

Patent Improved Blake Stone Breakers.

GUARANTEED NO INFRINGEMENT OF ANY PATENT.

AWARDED PRIZE MEDAL,

In competition with the best-known Stone Breakers,
September 7th, 1876,

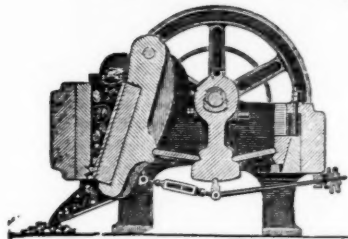
Formerly Manufacturers for the late H. R. Marsden, having made
for him in less than four years 336 Stone Breakers.

ESTABLISHED 1836.

Prices and particulars on application to the Patentees and Sole Makers,—

ROBT. BROADBENT AND SON, STALYBRIDGE.

LONDON OFFICE:—10, MOORGATE STREET, E.C.



British and Foreign Safety Fuse Company,

REDRUTH, CORNWALL,

MANUFACTURERS OF

SAFETY FUSE,
FOR MINING AND QUARRYING PURPOSES.

PRICES ON APPLICATION.



MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER

(ESTABLISHED 1790).

JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for
LEAD AND COPPER MINES.

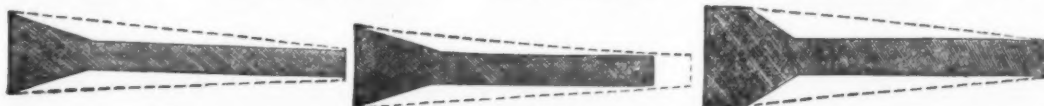
Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

Shipping Orders Executed with the Greatest Dispatch.

TO COLLIERY PROPRIETORS.

IMPROVED "REGISTERED" SECTIONS OF SCREEN STEEL.



No. 1.

No. 2.

No. 3.

THE DOTTED LINES SHOW THE ORDINARY SECTION, AND THE DARK GROUND THE IMPROVED SECTIONS.—
A saving of at least 30 per cent. is effected by the great reduction in weight of material.—For price and particulars apply to—

JOEL EATON WALKER, STEEL MERCHANT, SHEFFIELD.

NOTICE.—These Sections are Registered.

RAILS FOR SALE.

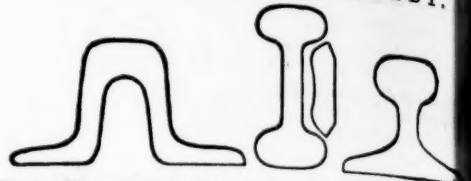
Bridge Section, 10 to 25 lbs. per yard.
Flange Section, 16 to 70 lbs. per yard.
DH Section, 50, 60, to 70 lbs. per yard.
Steel Rails, 30, 36, 54, 58, to 66 lbs. per yard.

NEW PERFECT, NEW DEFECTIVE, AND SECONDHAND STOCK.

PERMANENT WAY RAILS, of all sections, made to order.
For sections and price, apply to—

ROBERT WRIGHTSON,
NEWPORT, MON.

JOHN BEATSON, DERBY.



IRON AND STEEL RAILS, of all sections, from 10 to 82 lbs. per yard, new, defective, or second-hand.

POINTS AND CROSSINGS, FISH PLATES, BOLTS, NUTS, CHAINS AND SPIKES. LOCOMOTIVE ENGINES AND MACHINERY.

MALLEABLE AND PIG-IRON OF ALL KINDS.

Delivered at all Ports and Railway Stations in Great Britain.

A SECONDHAND SIX-WHEELED TANK LOCOMOTIVE FOR SALE.

BICKFORD'S PATENT
FOR CONVEYING
CHARGE IN



SAFETY FUSE
FIRE TO THE
BLASTING ROCK.

Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1862, the "INTERNATIONAL EXHIBITION" of 1867, and the "IMPERIAL EXHIBITION," held in Paris, 1867; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXHIBITION," in Paris, 1867; at the "GREAT INDUSTRIAL EXHIBITION," in London, 1862; TWO MEDALS at the "UNIVERSAL EXHIBITION," in 1873; and at the "EXPOSITION NACIONAL ARGENTINA," in South America, 1872.



BICKFORD, SMITH AND

of TUCKINGMILL, CORNWALL; AD-

BANK CHAMBERS, SOUTH JOHN-STREET, LONDON.

E.C., MANUFACTURERS AND ORIGINAL

PATENTEES OF SAFETY-FUSE, having

formed that the name of their firm has been attached

to the trade and public to the following announcements

EVERY COIL OF FUSE MANUFACTURED BY THEM HAS TWO SEPARATE

THREADS PASSING THROUGH THE COLUMN OF GUNPOWDER, AND

FORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS

AND THEIR TRADE MARK.

BENNETTS' SAFETY FUSE WORKS,

ROSEKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING

PURPOSES.

Suitable for wet or dry ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years experience as chief engineer of Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every quality at his own manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address.

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TO COLLIERY AND MINE OWNERS, ENGINEERS, IRONFOUNDERS

AND CONTRACTORS, &c.

JAMES AND KNOTT,

DARLINGTON.

Are now in a position to supply their "SPECIAL" LUBRICATING

PAINTS, PAINT OILS and VARNISHES of all kinds, TALLOW,

YARNS, GREASE, COTTON WASTE, LEATHER BELTING, INDIA-ROPE

GOODS and STEAM PACKING, NAILS, BOLTS, RIVETS, &c., from

stock, in large or small quantities, on receipt of orders.

Quotations given for new and secondhand machinery or stores, &c., on

application to—

JAMES AND KNOTT, COLLIERY AND ENGINEERS' STORE

DARLINGTON

MEXICO, NEW MEXICO, ARIZONA, UTAH, NEVADA

AND CALIFORNIA.

F. M. F. CAZIN,

MINING AND CIVIL ENGINEER

AT BERNALILLO, NEW MEXICO, U.S. OF AMERICA.

Has 24 years' experience in Mining and Smelting, and 10 years' experience in American Business and Law, offers his services at moderate charges for business on Mining and other Property in any of the above-named States or Territories, gives correct, safe, and responsible advice as to securing full titles and patents, and, as to best mode of utilizing the property, will assist in settling claims, and at real value; offers his assistance for securing undeveloped mining property at home prices. As to care taken in reporting, reference is made to the Mining Supplement, April 1, 1876, containing report on property of the Maxwell Grant and Railway Company; as to technical standing, to the prominent in the trade—compare Mining Journal of Aug. 30 and Nov. 31, 1872, and Nov. Engineer and Mining Journal, Feb. 28, 1874.

Maps of the Mines, and of UTAH TERRITORY

FROISETH'S NEW AND REVISED MAP FOR 1874

Size 40 by 56 inches, scale 8 miles to the inch. Handsomely engraved in counties, showing the Towns, Settlements, Rivers, Lakes, and Mining Districts, &c., throughout the Territory, and all the Government

to date. Mounted on cloth, 22; half-mounted, 21 12s.; pocket form, 41s.

Also, GENERAL MINING MAP OF UTAH, showing twenty-eight principal Mining Districts adjacent to Salt Lake City, and location of the

most important mines. Price, pocket form, 6s.

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DISTRICTS, showing the location of over Four Hundred Mines and Towns

together with the Mines Surveyed for United States Patent. Price, sheet, 10s.

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TRAUBNER and Co., 57 and 59, Ludgate Hill, London; or

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Just published, price One Shilling.

MINES AND MINING IN THE LAKE DISTRICT

with MAPS and DIAGRAMS.

By JOHN POSTLETHWAITE.

Apply to the Author, Eakin-place, Keswick, Cumberland.

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Now Ready, No. 1. of SPARGO'S MINING ATLAS.

Price 2s. 6d., by post 2s. 7d.

To be completed in Ten Parts or thereabouts.

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THE MINING ATLAS is designed to convey accurate

complete information concerning the CHIEF METALLIFEROUS

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productive Mines, together with most valuable statistical returns.

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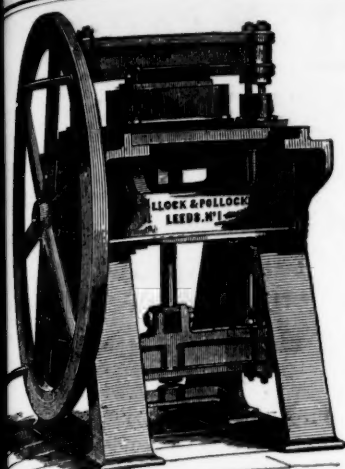
Treatment of Local Debility, Consumption, Loss of Memory, Physical Degeneration, Indigestion, and all diseases resulting from loss of nerve power. Illustrated with cases and testimonials. Sent free for two stamps.—Dr. H. SMITH will, for the

cases and testimonials. Sent free for two stamps.—Dr. H. SMITH will, for the

of country patients, on receiving a description of their case, send a

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THE CHEAPEST AND BEST IN THE MARKET.

COLLIERY ENGINEERS.—WINDING ENGINES OF ALL SIZES.

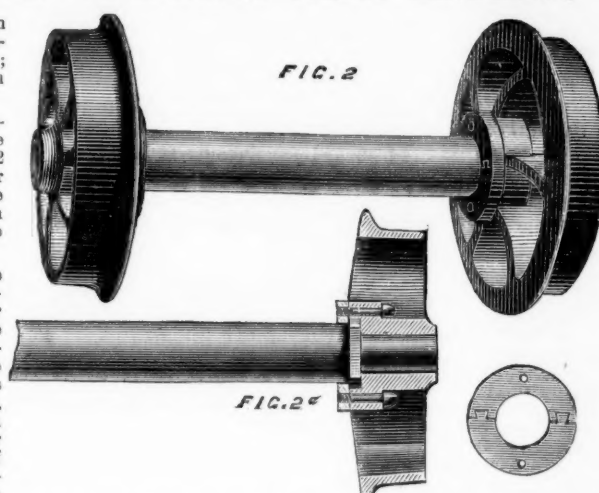
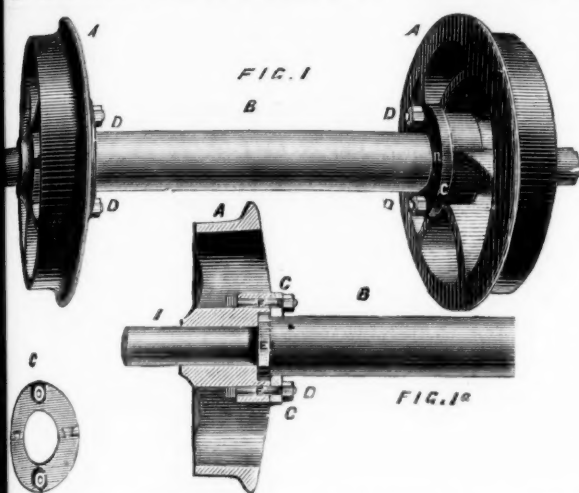
POLLOCK AND MITCHELL'S PATENT KILNS are the Cheapest and Simplest.

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MANUFACTURERS OF

HAVE PLEASURE IN CALLING THE ATTENTION OF THE MINING WORLD TO THEIR

Patent Method of Fitting up Cast Steel Wheels and Axles.



The advantages of the above system are :—A, the singular simplicity of fitting—enabling any inexperienced person, with the aid of a spanner or screw-driver, to detach the wheels from the axle or fit them together in a very short time. B, perfect solidity, the wheels and axles becoming as one piece. C, durability, no need of putting the wheels or axles into the fire, under any circumstances, which is so detrimental to wheels, rendering them remarkably brittle, and which under other systems are detached from the axle by the aid of fire. D, economy in fuel and wages, saving hundreds of pounds yearly to large coal owners. The

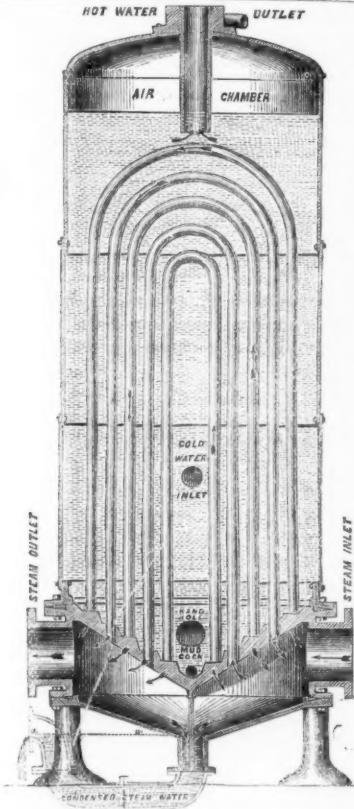
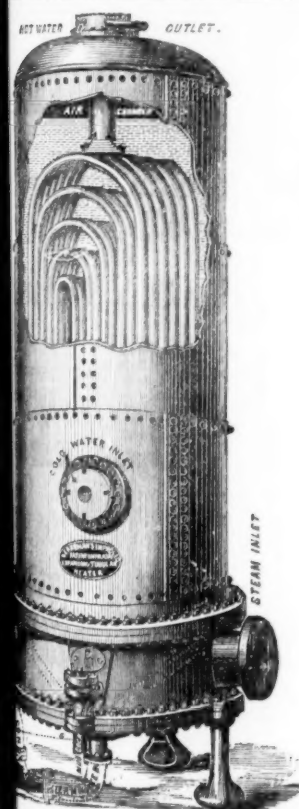
...dreds of pounds yearly to large coal owners. The progress of mining operations in this country, but have at once been fully recognised by leading authorities in the mining world.

IMPORTANT.

(LIMITED).

NEPTUNE FORGE ENGINE
AND BOILER WORKS,

TIPTON, STAFFORDSHIRE,



THE ENGINEERING BUSINESS lately carried on by R. BERRYMAN AND CO., at 23, Congreve-street, Birmingham, and 28, Wilson-street, Finsbury-square, London, have removed the works to their Works at TIPTON, to which place ALL COMMUNICATIONS SHOULD IN FUTURE BE ADDRESSED, and where the BERRYMAN HEATER can be seen at work, and in every stage of construction.

THE SOLE MAKERS and PATENTEES of these CELEBRATED COAL SAVERS and EXHAUST STEAM UTILISERS, and having remodelled and greatly improved them, adding largely to their HEATING SURFACE and WATER CAPACITY, J. W. and Co. have put down a special plant, which includes an entire new set of improved patterns, enabling them to offer these FEED WATER HEATERS to the public at

GREATLY REDUCED PRICES.

arrangement of BRASS TUBES of a great length giving an enormous HEATING SURFACE makes this HEATER not only the MOST POWERFUL ever invented, but its FIRST COST PER HEATING SURFACE IS LESS THAN HALF THAT OF ANY OTHER. It will condense the whole of the Exhaust Steam from the Engine if required, and entirely does away with the NOISE of the TUBES ARE OF SPECIALLY PREPARED SOLID DRAWN BRASS AND COPPER; both ends are expanded into the bored holes of the same Tube Plate, METAL TO METAL, and every Tube is free to expand and contract independent of each other. Leakage is impossible, as, when the tubes are once fixed, nothing short of cutting out will remove them. No scurf adheres to the inside of the tubes because of the difference of expansion between SCURF and BRASS. The inside of the Heater can be washed out by means of the mud cock and hand hole whilst at work. For use as a pump or injector is required, and as the Heater is placed between the pump and the boiler, the water is forced, COLD, into it, and passes out at the top HOT into the boiler direct. Where no pump or injector is required, the water being heated to BOILING POINT UNDER PRESSURE in the Heater, a saving of from 20 per cent. to 25 per cent. in fuel is effected; the disastrous results of grease in boilers are also avoided, and all other loose matter in the water being deposited in the Heater, the acids are liberated there instead of in the boiler. The Heater can be lined with BRASS, COPPER, or LEAD, as may be required in special cases for heating water or any kind of liquor in large quantities for CHEMICAL WORKS, BATHS, WASH-BOILERS, AQUARIA, GREENHOUSES, BREWERIES, WOOL WASHING, DYE WORKS, TANNERIES, &c., &c.; they will also HEAT AIR FOR CUPOLAS AND BLAST FURNACES, and are used as INTERHEATERS for compound engines with direct steam from the boiler with a further saving of 15 per cent. A New Price List, with detail information, is now ready, and will be sent on application, together with an Illustrated Catalogue, with references and testimonials from Firms using two HUNDRED AND THIRTY-THREE of these Heaters.

H. R. MARSDEN, PATENTEE AND ONLY MAKER BLAKE MACHINES, OF THE WELL-KNOWN ORE CRUSHERS AND STONE BREAKERS,

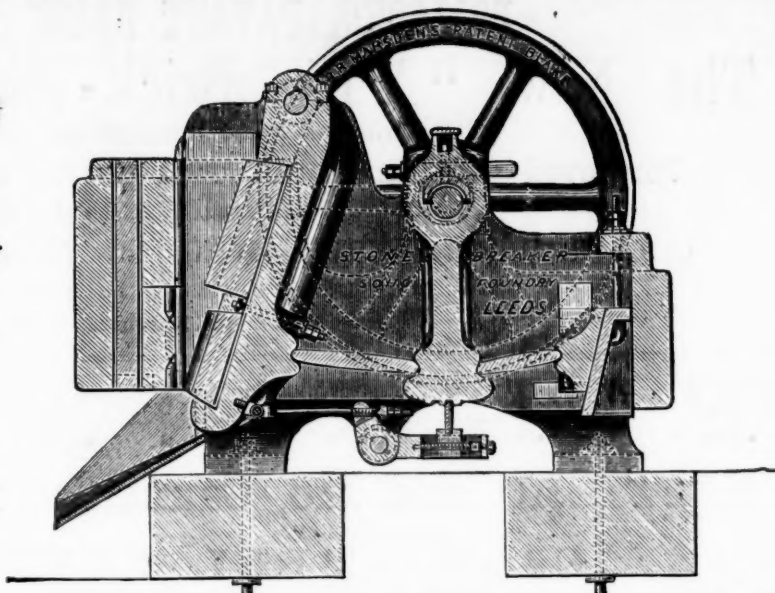
WITH THE
New Patent Reversible
CRUSHING OR CUBING
JAWS.

WHICH ARE CONSTRUCTED OF A PECULIAR
MIXTURE OF METAL, WEARING

Four times longer than any
other.

60 GOLD AND
SILVER MEDALS.

OVER 2000 NOW IN
USE.



For Crushing to any degree
of Fineness, or Breaking
to a required size.

Her Majesty's Government
USE THESE MACHINES
EXCLUSIVELY
ALSO ALL THE GREAT
Mining Companies of the
World.

H. R. M. has long observed the want of cheap
machines,
STONE AND ORE CRUSHERS,
And has at length, by means of improved appliances
for the production thereof, been enabled to reduce
the prices, yet keep up at the same time the well-
known strength of construction. Reduced prices
on application.

FIFTY per Cent., and upwards, saved by using these Machines.

TESTIMONIAL FROM MESSRS. JOHN TAYLOR AND SONS.

DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our management, and are pleased to be able to state that they have in all cases given the greatest satisfaction. We are, yours faithfully,
H. R. Marsden, Esq.

6, Queen-street-place, May 10, 1877.

JOHN TAYLOR AND SONS.

INTENDING BUYERS ARE CAUTIONED AGAINST PURCHASING OR USING ANY INFRINGEMENT OF THE NUMEROUS PATENTS OF H. R. MARSDEN.
ILLUSTRATED CATALOGUES, TESTIMONIALS, and every information, on application to:—

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.
ONLY MAKER OF SAULT'S PATENT SYPHON CONDENSER.

DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD METAL at the Newport and other Road Trusts, in your PATENT STONE BREAKER, AND ALL WITH ONE PAIR OF JAWS, which are STILL IN USE. I do not think at all, but am quite sure you are the only Machines which fully perform the work you set them out to do, and there are none in the Show can at all compare with them.
Yours, truly,
H. R. Marsden, Esq.

WILLIAM PRICE, Contractor, Gold Cliff, Monmouth.

Royal Agricultural Show, Liverpool, July, 1877.

TO COLLIERY AND MINE OWNERS. R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwt. "dead" weight per corve. Will hold 2 to 3 cwt. more coal than the ordinary kind, without increasing the outside dimensions. Can also be used as water tubs, and in thin seams are invaluable, as the height of the corves can be reduced without diminishing quantity of coal previously contained. In use, or on order, by the following collieries:
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Messrs. CLAYTON and SPEIGHT, Farnley, near Leeds.
Messrs. JAS. WORMALD and SONS, Rawdon, near Leeds.
KINGWOOD COAL and IRON CO., near Bristol.
MIDDLETON COLLIERY CO., near Leeds. | NEWTON COLLIERY, near Castleford. | Messrs. RUSHPORTH and Co., Adwalton, near Leeds. | Messrs. JAS. FUSSELL, SONS, and Co., Frome, Somerset.
T. VAUGHAN and Co.'s TRUSTEES, South Medomsley Colliery; and others.

R. HUDSON, Engineer and Ironfounder, Gildersome Street Foundry, near Leeds (Five minutes walk from Gildersome Station, G.N.R.)

The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1876, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS, and all necessary appliances for working the said Drills.

Apply to—

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